



Rancho Santa Fe Technology - MCS, Inc.

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Injury & Illness Prevention Program

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Approved by: _____

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President**

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PROGRAM SUMMARY

EXECUTIVE SUMMARY

The IIP Program is managed by the Safety Program Coordinator (SPC) and is implemented by the company at its offices and by the company's subcontractors at construction sites. Because the company employs only managers and office staff, the company requires and relies upon subcontractors to have and implement an effective IIP Program for their employees.

Consequently, the requirements for the program are incorporated in the company's contractual requirements for subcontractors.

The IIP Program provides for communication regarding the program requirements, the establishment and management of a program record-keeping system, and overall management and administration of the program. Communication with employees (permanent and temporary) is assured by signed employee safety and health agreements that acknowledge that employees are aware of the company's IIP Program and that their compliance is a condition of employment.

The program requires an initial inspection after the program is approved by management, and periodic inspections to assure program implementation. A checklist is used for company facilities and equipment, and a more extensive checklist is used for audits of subcontractor programs. The inspections will cover company facilities and equipment in ordinary use by employees. It requires follow-up to assure corrections of unsafe work conditions or practices/procedures, including the investigation of accidents. The program provide for initial and periodic training in the program as appropriate to the employees assignments.

The site Project Managers or Superintendents are designated as Safety Officers at their respective work sites. As such they are responsible for assuring that subcontractors at the site have and implement an IIP Program. In addition, they are responsible for determination of the existence of an emergency and direction of efforts to evacuate personnel and minimize loss. They will also assure that outside emergency services are called when necessary, and direct operations shutdown when necessary. They will designate an emergency response team that will include subcontractor Safety Officers trained in the use of fire extinguishers, first aid including CPR, any site specific shutdown procedures, and site evacuation procedures. The company Safety Officers will judge the adequacy of subcontractor programs based on observation of work practices and conditions at the site. If necessary the Safety Officer will order an audit of the contractor and improvements in the subcontractor's programs.

At the company offices, the functions of site Safety Officers are carried out by the IIP Program Administrator. This includes providing Project Managers a copy of program at each site, assuring communications aspects of the IIP Program, and posting mandatory state government bulletins.

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AUTHORITY

California Senate Bill 198 established the requirement for an Injury and Illness Prevention Program for all California employers. The authorization for the program is found in the California Labor Code, Section 6401.7 and the California Administrative Code, Section 3203. The latter provides the general requirements for employers, establishes a standards board, and sets penalties that may be assessed for violations of health and safety standards.

POLICY

Rancho Santa Fe Technology – MCS (Company) will administer a comprehensive and continuous occupational Injury and Illness Prevention Program for all employees. The health and safety of the individual, whether in the field or in the office, take precedence over other concerns. No person shall be required or instructed to work in surroundings or under conditions that are unsafe or dangerous to his or her health. The company will comply with all applicable health and safety standards and will assure that subcontractors have programs in effect that are also in compliance. Management's goal is to prevent accidents and minimize personal injury and occupational illness.

RESPONSIBILITY

The Program Administrator is responsible for overall management and administration of the Injury and Illness Prevention Program. Each Project Manager is responsible for implementation of the program at the project site. A copy of this program shall be available in the office and at each active job site.

RECORDKEEPING

The Company shall keep records of inspections to identify unsafe or unhealthy conditions and work practices. The records shall include the date of inspection, identification of the person who did the inspection, and a description of the unsafe/unhealthy condition or practices. The records shall be maintained for five years.

The Company shall also document safety and health training attended by each employee, including the training date, the employee's name, the type of training provided and the identification of the training provider. These records shall be maintained for five years.

INITIAL INSPECTION

An initial inspection was conducted when this IIP Program was initiated. Inspections will be conducted whenever potentially hazardous jobs, processes, procedures, or equipment are introduced into the workplace. An initial inspection will also be conducted when an existing safety or health hazard is discovered or reported to the company that has not previously been inspected. The latter inspections will be made in a timely manner based on the severity of the hazard. Imminent hazards shall be reported immediately to the Program Administrator.

SCHEDULED PERIODIC INSPECTION

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Inspections are conducted every month using inspection checklists. When an inspection is completed the inspector files the inspection checklist in the program file and logs the inspection on the inspection log. If corrections are necessary, a correction request/verification form is completed and assigned to the appropriate person.

SAFETY OR HEALTH CORRECTION

Whenever an unsafe or unhealthy condition, work practice, or work procedure is observed, discovered, or reported, the Program Administrator and/or the safety and health committee shall take appropriate corrective measures in a timely manner based on the severity of the hazard. The Program Administrator shall be notified immediately of an imminent hazard. Employees will be informed of the hazard and interim protective measures will be taken until the hazard is corrected.

IMMINENT HAZARD

Employees may not enter an imminent hazard area without protective equipment, training, and the prior specific approval of the Program Administrator. No employee may be required to enter an imminent hazard area as a condition of employment nor be fired or otherwise disciplined for refusing to enter an imminent hazard area.

EMPLOYER-EMPLOYEE COMMUNICATION

A suggestion box and suggestion forms are located in the Carlsbad office and on all job sites. The signature and name blanks are optional, so that employees making suggestions may remain anonymous. The administrator regularly reviews the completed suggestion forms. A responsibility notice is posted next to the suggestion box in the office and at each job site. The notice states who is responsible for the IIP program.

Tailgate meetings are held weekly at each job site. Employees are encouraged to bring up safety and health issues relevant to their jobs. Each employee present signs the attendance log. The logs are filed in the IIP Program. If a safety/health issue comes up that requires action, the program administrator is notified.

In order for each subcontractor to understand our commitment to safety and health on our job sites each subcontractor is required to read and sign a subcontractor safety and health agreement. This agreement is filed with the IIP Program.

DISCIPLINE

Anyone censuring an employee for communicating about safety and health issues is subject to disciplinary action, which may include termination. Employees who repeatedly violate safety and health codes will be fired. Any employee who is found purposely violating safety and health codes, where the violation puts other employees at risk, will be fired.

EMPLOYEE SAFETY AND HEALTH TRAINING

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Training is provided whenever a new substance, process, procedure, or equipment is introduced into the workplace and represents a new hazard. Training is provided whenever the company is made aware of a new or previously unrecognized hazard.

Training is provided to supervisors to familiarize them with the safety and health hazards, to which employees under their immediate direction and control may be exposed. Individual training is provided as required and whenever a new worker is hired or transferred to a new task. Group training is provided as appropriate when a new hazard is introduced on a job site that affects more than one worker. In each instance the training is recorded in the IIP Program.

ACCIDENT INVESTIGATION

Job-related accidents or illnesses are reported to the Injury and Illness Prevention Program Administrator. The accident/illness is investigated and an accident report form is completed to document the findings of the investigation within two weeks. The investigation is considered complete when the cause of the accident/illness is determined and corrective action, if any, is recommended. The accident report form is filed in the IIP program office.

CONSTRUCTION SITES

Each construction site is considered a Multi-Employer Work Site (MEWS), as defined by OSHA, one in which many employers occupies the same site. The general or prime contractor will be the controlling authority for all work site health and safety of the subcontractors. The general contractor's Superintendent will be the Safety Specialist at the work site to perform safety management, surveillance, inspections, and safety enforcement for the prime contractor.

The persons responsible for implementing the program are the appointed Safety Officers of each subcontractor's company, who shall have the authority and responsibility for its implementation, including general direction of employee and supervisor training programs and communications; monitoring and enforcement of employee compliance; evaluation and investigation of accidents and hazards; and conducting and/or monitoring of scheduled and periodic inspections.

The Superintendents (or equivalent) of each subcontractor will be appointed as Safety Officers. In addition, the Foreman are responsible for safety in their respective trades. The Foremen and General Foremen on each jobsite shall be directly responsible for the implementation of this program for each crew. All work is to be planned and supervised to insure safe working

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conditions at all times. Foremen are responsible that all Company employees and those of our subcontractors observe and obey the safety rules.

The general contractor's Safety Specialist and the Safety Specialists from each of the subcontractors will meet to discuss work procedures and safety precautions required by the Health and Safety Plan and to ensure the participation of all parties.

PROGRAM APPLICABILITY

This manual prescribes the health and safety requirements for construction activities and operations on all Rancho Santa Fe Technology-MCS, Inc.-MCS construction sites. It applies to RSFT-MCS employees, and employees of Subcontractors, Sub-Subcontractors, and Suppliers accessing the construction sites. It further applies to safety/health exposure for RSFT-MCS office personnel.

This plan will be adopted and implemented in compliance with the appropriate Labor Code Section for General Industry Safety in the state where the construction occurs. It is the responsibility of the Project Manager of each project to assure that the need for modification is communicated to the Program Administrator so that necessary revisions can be made to meet specific state requirements. States and territories in addition to California with federally approved safety and health plans include:

| | | |
|-------------|----------------|----------------|
| Alaska | Minnesota | Utah |
| Arizona | Nevada | Vermont |
| Connecticut | New Mexico | Virgin Islands |
| Hawaii | New York | Virginia |
| Indiana | North Carolina | Washington |
| Iowa | Oregon | Wyoming |
| Kentucky | Puerto Rico | |
| Maryland | South Carolina | |
| Michigan | Tennessee | |

Each employer shall be responsible for initiating and maintaining a safety and health program that complies with Federal and State OSHA requirements, and the requirements of this Program. It is the responsibility of the job site manager to inspect subcontractors to assure that each employer at the site maintains a program that meets the requirements of this program.

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DEFINITIONS

1. **Certified Industrial Hygienist.** An industrial hygienist is an individual who is certified by the American Board of Industrial Hygiene.
2. **Certified Safety Professional.** A safety manager, safety specialist, or safety engineer that has passed the CSP exam administered by the Board of Certified Safety Professionals.
3. **Competent Person.** A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
4. **Confined Space.** A space which, by design, has limited openings for entry and exit, unfavorable natural ventilation which could contain or produce dangerous air contaminants, and which is not intended for continuous employee occupancy. Confined spaces include, but are not limited to storage tanks, process vessels, pits, silos, vats, degreasers, reaction vessels, boilers, ventilation and exhaust ducts, sewers, tunnels, underground utility vaults, and pipelines.
5. **First Aid.** First aid is any one-time treatment, and any follow-up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care, even though provided by a physician or registered professional personnel.
6. **Imminent Hazard.** A hazard that could cause death or serious physical harm immediately, or before the danger could be eliminated through normal procedures. OSHA is authorized to seek immediate federal court action if an employer does not immediately correct an imminent hazard.
7. **Lost Workdays.** The number of days (consecutive or not) after, but not including, the day of injury or illness during which the employee would have worked but could not do so; that is, could not perform all or part of his normal assignment during all or any part of the workday or shift; because of the occupational injury or illness.
8. **Medical Treatment.** Medical treatment includes treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered personnel.
9. **Multi-employer work site (MEWS).** A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site.
10. **Operating Envelope.** There is an "operating envelope" around any crane, and inside the envelope are the operator, riggers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).
11. **Qualified Person.** One who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve or resolve problems related to the subject matter, the work or the project.

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12. **Recordable Occupational Injuries or Illnesses.** Any occupational injuries or illnesses which result in:
- a. Fatalities, regardless of the time between the injury and death, or the length of the illness; or
 - b. Lost Workday Cases, other than fatalities, that result in lost workdays, or
 - c. Non-Fatal Cases without lost workdays which result in transfer to another job or termination of employment, or require medical treatment (other than first aid) or involve: loss of consciousness or restriction of work or motion. This category also includes any diagnosed occupational illnesses which are reported to the employer but are not classified as fatalities or lost workday cases.
13. **Safety Officer.** The superintendent or other qualified or competent person who is responsible for the on-site safety required for the project.
14. **Serious Accidents.** Any work-related incident, which results in, a fatality, in-patient hospitalization of three or more employees, or property damage in excess of \$200,000.
15. **Significant Accident.** Any contractor accident which involves falls of (4 feet) or more, electrical accidents, confined space accidents, diving accidents, equipment accidents, crane accident or fire accidents, which, result in property damage of \$10,000 or more, but less than \$200,000; or when fire department or emergency medical treatment (EMT) assistance is required.
16. **Weight Handling Equipment (WHE) Accident.** A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1. PROGRAM MANAGEMENT

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The management of Rancho Santa Fe Technology – MCS, Inc. is committed to a successful Injury and Illness Prevention Program. The program is organized under the leadership of the General Manager, who serves as the IIP Program Administrator. Each Site/Project Manager reports to the Program Administrator and is designated as the Project Safety Representative for the Company at their respective sites. Each subcontractor will be required to designate a Project Safety Representative, and provide assurance that the subcontractor has an IIP Program in effect.

The program includes a safety communications system, procedures for assuring compliance with safe work practices, and scheduled inspections and evaluations. Accidents or job-related illnesses will be investigated under the leadership of the Program Administrator and issues will be identified and recorded for follow-up corrective action. The IIP Program provides safety and health training/instruction both for office and field personnel, and record keeping and documentation of both accident/illness reports and training accomplished.

PROGRAM ADMINISTRATOR

The program administrator is responsible for establishing workplace objectives for accident and illness prevention, for identifying issues that may be common to sites and reporting them to the management team, for assuring follow-up on issues and suggestions, and for maintaining records as specified in the program. In addition, the administrator advises management of the status of this safety and health program and makes recommendations regarding improvements or additions to the program.

PROJECT SAFETY REPRESENTATIVE

Each Contractor working on a RSFT-MCS construction site shall designate a Project Safety Representative responsible for enforcing the daily activities of this program for his company as described in this manual and the following:

- Preplanning work activities for safety.
- Daily job site inspections.
- Ensure that corrective action is taken when there is an unsafe act or unsafe condition.
- Enforce employee and subcontractor disciplinary policies.
- Ensure subcontractor safety compliance.

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- Ensure that safety meetings are given.
- Ensure that every employee goes through safety orientation before starting work.
- Ensure that proper personal protective equipment (PPE) is available and being used.
- Ensure that communication from employees is being acted upon.
- Notifying the RSFT-MCS Safety Representative of an injury/accident.
- Accident investigation and follow up.
- Attend all Project Safety Meetings.
- Arrange for weekly Safety Talks.
- Be responsible for Subcontractor accident reporting requirements.
- Make provisions for immediate first aid and/or medical/hospital treatment for work related injuries and illnesses of their employees.
- Post a copy of the Medical Emergency Procedures and the Fire Emergency Procedures.
- Report all safety and health related matters to the Project Superintendent and/or the Project Safety Manager.
- Ensure that Employee Information and Training is completed and documented for new employees prior to starting work on the project

IMPLEMENTING THE RSFT-MCS IIP PROGRAM AT COMPANY OFFICES

The following steps will be taken by Company management to establish and implement the IIP Program:

1. Designation of a Company IIP Program Administrator
2. Preparation of an IIP Program document for the company
3. An initial inspection of the company offices by the Program Administrator
4. Initial inspections of the on-going projects by Project Managers to assure that subcontractors have implemented corresponding IIP Programs, and that the project is in compliance with program requirements.
5. Issuance of the IIP Program document to company Project Managers
6. Training of company Project Managers in the requirements of the program, and specific training in first aid and CPR for the Program Administrator and the Project Managers
7. Schedule periodic inspections to assure that the program as implemented is in compliance with program requirements.

IMPLEMENTING THE RSFT-MCS IIP PROGRAM ON THE JOB SITE

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The following steps will be taken by the RSFT-MCS Project Manager upon setting-up operations on a construction job site. The RSFT-MCS Project Manager is the appointed administrator of the plan on the job site.

1. Determine the requirements of the State and Local OSHA administrators or other parties having jurisdiction. Present this plan.
2. Coordinate with the Owner/Site Manager the plan for Health & Safety.
3. Identify and record all health and safety hazards not already identified in the plan.
4. Create a system of monthly inspections following the plan requirements.
5. Follow the procedures and practices detailed in this plan for dealing with unsafe or unhealthy conditions.
6. Initiate the system for communicating with employees on unsafe matters outlined in the plan. Place a suggestion box in the project management office.
7. Implement a training program for employees as outlined in the plan. Conduct the training necessary to complete the required forms in the appendix to this plan.
8. Complete all post required forms and notices in the appendix to this plan.
9. Complete the Program Maintenance check list to verify that this Health and Safety Program is fully functional.

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INTRODUCTION

The following material is to be regarded sets of standards to be made a part of our operations on each and every jobsite and work location. Its effectiveness at each location will be the direct responsibility of each Superintendent/Project Manager. Each Superintendent/Project Manager is expected to discharge this responsibility vigorously. Because the Company's role and expertise is construction management and much of the physical work is done by subcontractors, you are responsible for assuring and documenting that the subcontractors have a functioning IIP Plan that covers their specialty in an appropriate level of detail. An inspection checklist is provided in appendix A. A form for documenting the inspection is provided in Appendix B.

Under the law of most states, both the employer and the Superintendent/Project Manager are responsible for workplace safety. As a Superintendent/Project Manager, YOU are responsible for conducting daily inspections of the jobsite or shop and eliminating or correcting any and all hazards that are found and any that are reported to you. You are responsible for knowing to which emergency hospital a severely injured employee should be transported.

We cannot allow employees to work in an area in which they could be exposed to injury or illness. In the case of an imminent hazard, such as a fire or airborne asbestos particles, employees must immediately leave the area until the hazard is past.

In addition to identifying and correcting unsafe jobsite conditions, you are responsible for identifying and correcting an employee's unsafe work practices or habits. This can be done through proper training or re-training, reassignment, or in extreme cases, suspension or discharge. We cannot employ people who have unsafe habits, poor judgment, become careless or exhibit self-destructive behavior to endanger themselves or others. Proper selection, evaluation of physical abilities, training, assignment to appropriate tasks, and later reevaluation, are all vital to jobsite safety.

This Manual shall be issued to each Superintendent/Project Manager. Management may update it from time to time and revisions will be distributed as appropriate. Upon written request, it may be distributed to General Contractors, Owners or Awarding Agencies, as appropriate.

Employees who fail to adhere to job safety and health standards are subject to disciplinary action, including, but not limited to verbal reprimands, written warnings, suspension, and/or

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immediate discharge. The degree of discipline in any instance is at the sole discretion of the Superintendent/Project Manager or management. Nothing in our Injury and Illness Prevention Program, however, shall alter the right of any employee or the employer to terminate employment at any time with or without cause or notice.

INJURY AND ILLNESS PREVENTION PROGRAM

It is the goal to provide a safe and healthy workplace for all employees and to prevent occupational injuries and illnesses. The safety of every man and woman is of the utmost importance and shall not be compromised, even for operating efficiency and productivity.

To attain this goal, an injury and illness prevention program is adopted in compliance with the Labor Code Section in the state of the project, and meeting other applicable local, state, and federal laws; and with input from our compensation carrier. The program includes training and instruction concerning safe and healthy work practices applicable to the job as well as means for investigating work-related injuries and illnesses, identifying and evaluating workplace hazards, and correcting unsafe work conditions.

To be successful, the program requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and his or her coworker. It is the obligation of every employee to comply with the requirements of the injury and illness prevention program at all times.

REPORTING UNSAFE WORKING CONDITIONS

Employees have the OBLIGATION and RIGHT to report unsafe conditions, unrecognized safety hazards, or safety violations of others without adverse consequence to them. Such a report may be made orally to the Superintendent/Project Manager or to another member of management. Reports or concerns may also be submitted in writing, and will be considered, whether signed or anonymous. Any employee also has the right to report such matters to the State Division of Occupational Safety and Health. Employees who report unsafe work conditions or practices are protected by law and may do so without fear of reprisal.

REPORTING WORK-RELATED INJURIES AND ILLNESSES

All employees must report any work-related injuries and illnesses, regardless of their type or seriousness, to their Superintendent/Project Manager or other supervisor IMMEDIATELY. The supervisor will fill out a Supervisor's Accident Investigation Report and send it as soon as possible to the Department Superintendent, who will review it and forward it to Payroll.

If an employee is injured or becomes ill because of work, they may be entitled to workers' compensation benefits. Except in the case of minor, "first aid only" injuries, Payroll will mail or deliver to the injured employee an "Employee's Claim for Worker's Compensation Benefits"

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NOTE: Employees who report work-related injuries and illnesses are protected by law and may do so without fear of reprisal.

FIRST AID AND MEDICAL ATTENTION

All injuries must be immediately reported to the Superintendent/Project Manager or supervisor, and proper treatment must be obtained for all injuries and illnesses, no matter how slight:

1. Basic first aid is ordinarily adequate treatment for minor cuts, abrasions, and similar injuries; emergency medical attention must be obtained in the case of more serious injuries or illnesses. The following actions should be taken as required by the extent of the injury:
 - a. First aid should be administered if needed to control bleeding or prevent further injury. Persons who have broken bones or are bleeding from internal injuries should not be moved unless absolutely necessary. Note: If the victim is in contact with a live electric current, turn the electricity off before touching.
 - b. The appropriate emergency response personnel (fire department, ambulance, etc.) must be notified immediately (911) if on-site medical attention and/or transport to an emergency hospital is required because of the seriousness of an injury.
 - c. If, because of the lesser degree of injury, emergency response personnel is not needed for transportation, the injured should be transported for treatment to a licensed medical professional and/or facility approved by our compensation carrier.
 - d. One person on the jobsite is to be currently certified as having taken the Red Cross First Aid course, or similar program. This does not necessarily have to be a General Contractor employee. All employees are encouraged to become trained in First Aid and Cardiopulmonary resuscitation (CPR).
2. If a toxic or hazardous material comes in contact with the body, the applicable treatment must be administered in accordance with the Material Safety Data Sheet for the substance. While injury to the eyes or skin caused by chemical contact normally is best treated by flushing with water, there may be exceptions. MSDS instructions and professional medical advice must be followed.

GENERAL SAFETY RULES (Code of Safe Practices)

All work is to be well planned and supervised to insure safe-working conditions. Supervisors are

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to insist that all Company employees and those of our subcontractors observe and obey safety rules. Employees will receive accident prevention training at least every two weeks. Safety is the direct result of safe working conditions combined with common sense safe work practices. Sound judgment, safe work practices and alertness must be exercised by employees at all times.

1. Proper clothing will be worn. Loose or frayed clothes, shorts, soft shoes or shoes in bad repair are prohibited. Shirts and hard hats are to be worn at all times. Wear rain gear when appropriate. Gloves and boots are to be worn when working in wet concrete. Protective clothing and equipment, such as earplugs, safety glasses, toe guards, welding hoods, masks or respirators, shall be used as directed by supervisors.
2. No one in possession of or under the influence of drugs or alcohol shall be allowed on the jobsite. Anyone ill or fatigued will not be permitted to work.
3. Work areas shall be kept clean and free from hazards. Spills or water is to be cleaned up immediately. Unsanitary conditions are to be reported to the Job Foreman.
4. Training shall include proper lifting techniques, including using leg, not back muscles, keeping the back straight and not twisting, and getting help with heavy loads.
5. Motorized equipment, powder-actuated tools and shop machinery are only to be operated by employees who have received proper training, are experienced, and are authorized.
6. Workers are to be adequately protected from hazards of loads or objects overhead. No worker is to throw or drop objects while above another. Drop lines are to be used to raise or lower tools.
7. Gas cylinders are to be secured in an upright position, capped, and kept free from oil and grease. Oxygen and acetylene cylinders are to be stored separately.
8. All nails or protruding tie wire shall be bent or removed.
9. Ladders and scaffolds are to be in good repair, firmly placed with proper bearing and/or secured. Damaged ladders, scaffolds and other support structures are to immediately taken out of service.
10. Trenches or excavations deeper than 5 feet must be properly shored or sloped. Tanks, manholes, underground vaults or other confined spaces should be ventilated or tested before entering.
11. Employees are NOT to work in any area with improperly guarded wall and floor openings. Floor penetrations over 5 inches should be covered or signs should be posted near elevators and stairwells.

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12. Tampering with electric equipment, machinery, air, gas or water lines is prohibited. Equipment is to be locked out before repairs or adjustment are made. Power tools and cords are to be properly grounded. Guards, brakes, switches or other protective devices must be in place and used. Only minor repairs may be made in the field. Defective equipment is to be immediately taken out of service and returned to the Tool Room for repairs.
13. Fire protection and prevention practices, including access to fire extinguishers near welding operations, the clearance of passage aisles and doorways, proper storage of flammable materials, and control of smoking and open flame, must be observed at all times.
14. Engines are to be shut down before fueling. Gasoline is NEVER to be used for a cleaning solvent. All regulations regarding the use of, labeling and signs, storage and disposal of hazardous materials and wastes are to be strictly adhered to.
15. Nails or spikes should never be left sticking out of planks, boards, or other timbers. Pull them out or clinch (bend) them over.
16. Employees are not to work in areas above vertically protruding reinforcing bar, unless the re-bar has been covered to prevent piercing injuries should a fall occur. Plastic caps over the ends of re-bar is not sufficient protection.
17. Never throw or drop material, tools or other objects from above.

In addition to the general rules listed above and the practices listed in this Job Safety Handbook, other more specific safe and healthy work practices may apply to a specific job assignment. All employees must comply with all laws, rules, and regulations concerning safe and healthy work practices as published by governmental agencies having jurisdiction over such matters.

EMERGENCY ACTION PLAN

1. In the event of fire and other emergencies, all persons are to evacuate the jobsite in an orderly and safe manner by using the nearest exit and safe stairs. Before leaving, operators should turn off all machinery. Welders should shut the valves on the cylinders of their oxygen and acetylene or other flammable gases. The Superintendent/Project Manager shall assign an individual to shut the main gas supply line to the building.
2. The Superintendent/Project Manager at each jobsite shall designate a safe assembly point outside.
3. Once outside, roll will be taken and an attempt will be made to locate any missing

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persons. The senior Foreman will advise the Fire Department, or public safety officer in charge, of all persons who are not accounted for and their last known location.

4. Individuals who have had first aid training shall assist emergency medical personnel as requested.
5. Fires and other emergencies shall be announced over the public address system by the most senior manager present. Also, the sprinkler alarm will be sounded.
6. At a jobsite, the senior Foreman present, is to sound the alarm and order the evacuation of all employees and also notify the Superintendent/Project Manager or Owner of the emergency. If time does not permit otherwise, anyone may sound the alarm.
7. It is the responsibility of the employees working on the highest floor, or at the point furthest from the exit to spread the alarm to others while making their exit from the building.
8. Notify the Company Safety Officer. Of any emergency requiring a response by emergency medical personnel at the Fire Department The office number is 760-603-1790.

3. SAFETY PROGRAM ADMINISTRATION

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EVALUATION OF WORKPLACE HAZARDS

Evaluation and analysis of workplace hazards requires looking at each step of a job, identifying existing or potential safety and health hazards, and determining the best way to perform the job to reduce or eliminate these hazards. Improved job methods can reduce or eliminate hazards, reduce the costs resulting from employee absenteeism and workers' compensation, and lead to increased productivity. An effective hazard evaluation method must be used in establishing safe work practices for a work process, shop or jobsite.

There are OSHA standards that apply to most shop or jobsite operations and compliance with these standards is mandatory. These standards should be referred to as part of the overall hazard evaluation and analysis process. Applicable sources of information should be reviewed when completing the hazard evaluation process.

1. External information can be useful in analyzing workplace hazards, such as other contractors which use the same or similar equipment, processes, and materials; trade associations such as SMACNA, MCAA, AGC, PPIC or PHCC. For safety and health information unique to the construction industry; The National Safety Council or Workers' Compensation carrier; or governmental safety and health agencies that publish guidelines for employers on a wide variety of such matters.
2. Internal sources should also be used in hazard evaluation. Review reported injuries and illnesses and use the information to identify areas and tasks of high risk. Employees and supervisors should be encouraged to identify potential hazards. Involve employees in all phases of the analysis, from reviewing job steps to discussing potential hazards and recommended solutions.

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GENERAL WORKPLACE HAZARDS

General conditions of the workplace should be reviewed, with attention to the following:

1. Materials on the floor that could trip a worker.
2. Adequacy of lighting.
3. Electrical hazards that could accidentally be activated. Machinery and circuits should be locked out where workers could be exposed.
4. Any explosive hazards associated with the job or likely to develop, such as a build-up of natural or other gasses.
5. Tools, including hand tools, machines, and equipment which may be in need of repair. Are there switches, guards or safety controls missing or rendered inoperable?
6. Excessive noise in the work area that may require hearing protection or may hinder worker communication.
7. Fire protection equipment is to be readily accessible, with a current inspection tag. Have employees been trained to use it?
8. Floor openings properly guarded? Are there any guardrails missing?
9. Are *forklifts* or other motorized vehicles properly equipped with working brakes, overhead guards, backup signals, horns, steering gear, and identification, as necessary? The employees operating forklifts or other motorized equipment must be properly trained.
10. Employees are to be properly dressed, wearing pants, heavy shoes, shirts and hardhats. Safety glasses or foot protection may be required for certain tasks:
11. Have any employees complained of headaches, breathing problems, dizziness, or strong odors?
12. Ventilation is to be adequate, especially in confined spaces. Filters, masks or respirators are to be made available.
13. Welding screens are to be used, to avoid injury to others.

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SPECIFIC HAZARDS

A Hazard Evaluation Form should be used to identify hazards and evaluate unique jobsites, machinery, and processes where a more specific evaluation should be made.

With input of the employees who perform the work, each step or task of the job should be listed in order. The evaluation should also include identification of specific hazards that may occur during each step and what changes in operation, safe practices, or protections may be used to eliminate or reduce the hazard. For example:

1. Is the worker physically able to perform the task assigned?
2. Is the worker wearing protective apparel and equipment, including safety belts or harnesses that are appropriate for the job?
3. Are work positions, floor perimeters and penetrations, stairwells, machinery, and hazardous operations adequately guarded?
4. Are lockout procedures used for deactivating equipment during maintenance procedures?
5. Is the worker wearing clothing or jewelry or hairstyle that could get caught in the machinery?
6. Are there fixed objects or sharp edges that may cause injury?
7. Is the flow of work improperly organized?
8. Can the worker be injured by reaching over moving machine parts or materials?
9. Does the arrangement of equipment and tools place the worker in an off-balance position? Is the worker using ladders properly?
10. Is the worker keeping hands and fingers positioned in a way that is potentially dangerous?
11. Is the worker making movement that could cause hand or foot injuries, or strain from lifting?
12. Can the worker be stuck by an object or lean against or strike a moving part of an object?
13. Can the worker fall from one level to another?
14. Can the worker be injured from lifting or pulling objects, or from carrying heavy objects?

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15. Can the worker be exposed to environmental hazards (chemical, dust, radiation, welding rays, heat, or excessive noise)?

The observation should be repeated as many times as necessary until all hazards have been identified. A training program, including all safe practices listed on the evaluation form, should then be written based on the findings of the evaluation process.

Daily inspections, with particular attention to the above items, are to be noted on the Foreman's Daily Log.

Exits And Egress: All exit doors and passages must be clear and free of obstruction. Exit signs, and their illuminating light source, must be kept clear of obstruction and in place at all times.

Stairs And Stairways: Handrails on stairways must be used to prevent falling; steps should be taken one at a time. Slip resistant material applied on the surface of steps must not be removed. Where stairs or stairways exit directly into any area where vehicles may be operated, barriers and warnings must be observed to prevent stepping into the path of traffic.

Walkways: Aisles and passageways must be kept clear of obstruction. Materials spilled in walkways must be cleaned up immediately. Other walkway requirements are:

1. When present, markings on aisles and walkways must be observed.
2. Materials or equipment must be stored in such a way to not interfere with walkways. Materials must be stored so that adequate headroom is provided for the entire length of any aisle or walkway.
3. Safe clearance must be allowed for walking in aisles where motorized or mechanical handling equipment is operating.
4. Bridges over equipment and similar hazards must be kept in place.

UPDATING EVALUATIONS

In addition to the regular daily and weekly inspections, updating hazard evaluations is recommended when:

1. An accident or injury occurs.
2. There is a report of an unsafe work condition, whether by an employee or as the result of an inspection.

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3. The job, machinery, process, method, or material changes.
4. A new process or job situation is encountered.

SAFETY INSPECTIONS

The objective of regular safety inspections is to use specific procedures to identify conditions and work practices that may lead to job-related injuries and illnesses.

General inspections are comprehensive reviews of all safety and industrial health exposures in the facility or site. Special inspections deal with specific exposures associated with unique hazards of specific job categories, work areas or sites, machinery, processes, etc.

Frequency: Inspections normally are conducted:

1. Daily, by the Superintendent/Project Manager on every jobsite.
2. In the case of serious injury accident.
3. When an employee files a complaint of an unsafe condition.

CORRECTIVE ACTION

As determined by an inspection, all items in need of correction are listed on the Corrective Action Plan attached to the Inspection Checklist. Those of more serious nature may also be documented on a Hazard Survey Report (see Forms Supplement).

The action plans required to correct hazards identified in an inspection should be classified by priority:

PRIORITY HAZARD

1. The most serious type of unsafe condition or unsafe work practice could cause loss of life, permanent disability, the loss of a body part (amputation or crippling injury), or extensive loss of structure, equipment, or material. Immediate correction action is required. Replace immediately, or remove from service. Determine the basic causes of the problem and assign responsibility for correction and a deadline for correction. Repair, replace, or remove defective equipment from service revise unsafe process or procedures.
2. Unsafe condition or work practice that could cause serious injury, industrial illness, or disruptive property damage. Immediately assign responsibility for correction. Complete repairs or corrections or develop definitive training assessment of issues and corrective action or retraining plan.

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3. Unsafe condition or unsafe work practice that might cause a recordable injury or industrial illness or nondisruptive property damage. Assign responsibility for correction and set a time frame for correction. Give priority on regular maintenance schedule, advise supervisors or managers in writing to develop training programs to overcome the problem.
4. Minor conditions, a housekeeping item or unsafe work practice infraction with little likelihood of injury or illness other than perhaps a first-aid case. Assign responsibility for correction and set a time frame for correction. Work into regular maintenance schedule. Advise supervisors to retrain workers involved.

INJURY REPORTS AND ACCIDENT INVESTIGATION

Investigation And Reports:

All accidents (and all near misses) are to be reported to the Foreman or other supervisor, without exception. The Foreman will investigate the accident, determine its cause and make or arrange for any corrective actions. The Foreman will then fill out a Supervisor's Accident Report form and send it to the Department Superintendent, who will review it and send it on to the Payroll Department. The Foreman will also note the accident and the resulting inspection in his Foreman's Daily Log book.

Workers' Compensation:

Under most state law, an employer must provide an Employee's Claim for Workers' Compensation Benefits to the employee within one work day of the employer's knowledge of the injury (except for first-aid or one-time treatment of minor scratches, cuts, bumps or splinters, not requiring the services of a physician). Upon knowledge of the accident or illness, the Foreman or other supervisor must notify the Department Superintendent, who will then advise the Payroll Department of the employee's name, time and nature of the injury, and medical facility or hospital, if treatment was sought. If the Superintendent is not available, the Foreman must contact the Payroll Department with this information directly. Payroll soon enough will then mail or otherwise deliver the Employee's Claim form to the injured employee. Upon receipt of the completed form from the employee, a copy is to be sent to the insurance company and one is retained in the employee's personnel file. This form does not replace the Employer's First Report of Occupational Injury or Illness discussed below.

Reporting To The Compensation Carrier:

In the case of any injury or illness requiring the treatment of a physician, hospitalization, or resulting in time lost, (the employee misses more than one day of work), an Employer's First Report of Occupational Injury or Illness (provided by the compensation carrier and meeting the criteria of DLSR Form 5020) must be submitted by Payroll soon enough time to reach the insurance carrier within five (5) days of the injury. Do not wait for the Employee's Claim for Workers' Compensation or for a doctor's first report before submitting this form.

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Medical Treatment:

The employer (or the insurance company where the employer is insured) has the right to designate the physician who will provide medical treatment for the first 30 days after an injury is reported (conditions above regarding an employee's personal physician also may apply). A list of approved medical facilities is maintained at each jobsite. Requests for lists or updates should be directed to the Payroll Department. Employees may select their own treating physician 30 days or more after the injury was reported. The law states that, at any time after the injury, employees have the right to use, at their own expense, a consulting or attending physician.

Correction Of Workplace Hazards Resulting In Injury:

Corrective steps must be taken to eliminate workplace hazards that may have been discovered in the course of accident investigation. Notations on the Foreman's Daily Log should be used to document the investigation, conditions and hazards identified, required corrective actions, and persons responsible for making the correction.

PREVENTATIVE MAINTENANCE

Preventive maintenance of equipment and facilities is an especially important means of anticipating potential hazards and preventing their development. Planning, scheduling, and tracking regular maintenance activities provides a systematic means of avoiding neglect. Manufacturer's recommended equipment and machinery maintenance schedules are designed to reduce wear, breakdowns, fire danger, and operational problems.

Tool repairs are not to be made in the field. Each time a tool or other piece of equipment is checked in to the Tool Room, it is inspected and repaired as necessary, before being issued again. Vehicles, including jobsite trucks, are to be serviced every 3,000 miles or every 90 days. Electrical extension cords to be inspected for breaks and cuts, exposed wires, missing plugs and improper ground every 3 months.

SAFETY POLICY VIOLATIONS AND DISCIPLINE

General safety rules and specific safe and healthy work practices must be understood and followed by all employees. To ensure employee compliance, Foremen should provide both positive reinforcement (recognition for safe work habits) and correction of unsafe performance (disciplinary action through a clearly communicated system).

When needed, discipline should not, however, be punishment. Instead, it should be used as a means of turning negative actions into positive responses, of helping to solve employee problems, and helping employees learn to take responsibility for their own actions. To be effective, Foremen should:

1. Establish and Communicate Your Expectations: When employees know exactly what to

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expect, they will perform better and, in most cases, cooperate by disciplining themselves. Safety rules should be communicated verbally and backed up with written material or posted notices. The more often rules and safe practices are communicated, the more likely that they will be followed.

2. Quick Response: When safety rules and safe work practices are violated, supervisors must respond quickly. The employee must know that the discipline is a direct result of the behavior.
3. Act Consistently: So far as possible, the supervisor's response to similar safe and healthy work practice violations should be similar in degree; the focus should be on the infraction, not the individual.
4. Counsel and Motivate: The goal in confronting safety violations is to find out what caused the behavior, reduce tension and improve communication, and develop solutions that will cause improvements. The employee should be involved in the solution; the goal is not to punish, but rather to change unacceptable and unsafe behavior.
5. Progressive Discipline: Corrective action should be applicable to the seriousness of the infraction. Progressive discipline can provide the documentation needed to support eventual discharge if appropriate.
6. Documentation: Significant disciplinary actions should be noted on the Foreman's Daily Log. It should include the time and place of the infraction; factual details of the incident; specific rules violated; and remedial steps recommended to avoid further action.

EMPLOYEE TRAINING

Effective employee training is critical to implementing a productive injury and illness prevention program and it must be presented so that its purpose is clearly understood by all employees involved. Safety training will be conducted for employees as follows:

1. All new hires or rehires will receive general safety training and will be required to review the Company Safety Instructions.
2. When an employee reports to a new jobsite, he or she shall become familiar with the safety considerations of that jobsite.
3. Whenever an employee is assigned a new task or process for which he or she has not been previously trained, then training for the safe operation of that task or process shall be given that employee. Also, whenever, in the opinion of the Foreman, that additional training is required.

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4. Toolbox or tailgate safety meetings shall be conducted every ten working days for all field construction and service personnel, unless required to be weekly by terms of our contract with an owner or general contractor. In addition to any topics for discussion which may be provided, any other safety matters may be discussed, including issues raised by any employee. Employees will sign their attendance (see Forms Supplement) and the sign-in sheet will be forwarded to the Project Management office for filing. Such records of safety training will be maintained with that particular job files for so long as that group of files are kept, but for no less than 3 years.
5. During implementation of this IIPP Program, shop employees shall be re-trained on any equipment, forklifts, etc., which they operate. Documentation of the training shall be maintained by the Department Superintendent or Shop Foreman for a minimum of 3 years.

Training Records:

All training events, whether for an individual or groups of employees, will be documented and the record of the training maintained by Project Management, the Department Superintendent or Shop Foreman, as outlined above.

Training For New Hires And Transferred Employees:

Safety training for new employees should be conducted BEFORE the employee begins work. Similarly, employees transferred to a new assignment where new hazards are present for which they have not received training should be given the appropriate training BEFORE beginning the new assignment. Training shall be certified in writing as completed.

4. INJURY AND ILLNESS PREVENTION PROGRAM PLAN

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INTRODUCTION

This Health & Safety Plan shall be adopted and implemented in compliance with the appropriate Labor Code Section for General Industry Safety in the state where the project occurs.

The person responsible for implementing the program is the Company Safety Officer, named by each contractor, subcontractor, sub-subcontractor and supplier, who shall have the authority and responsibility for its implementation, including general direction of employee and supervisor training programs and communications; monitoring and enforcement of employee compliance; evaluation and investigation of accidents and hazards; and conducting and/or monitoring of scheduled and periodic inspections.

The Superintendents of each subcontractor shall be appointed as Safety Officers on each site. In addition, the Foreman are responsible for safety in their respective trades. The Foremen and General Foremen on each jobsite shall be directly responsible for the implementation of this program for each crew. All work is to be planned and supervised to insure safe working conditions at all times. Foremen are responsible that all Company employees and those of our subcontractors observe and obey all safety rules.

SYSTEM FOR ENSURING EMPLOYEE COMPLIANCE

At the time of initial employment and at other periodic intervals, employees shall be notified through each Company's Safety Instructions, Safety Meetings, and by other written or verbal communications and various other methods that compliance with established and/or common sense safe and healthy work practices, is a mandatory condition of employment. Employees who fail to adhere to job safety standards are subject to disciplinary action, including, but not limited to, verbal reprimands, written warnings, suspension, and discharge. Any action or set of actions may be accelerated, adjusted, skipped, modified, repeated, or intensified at the sole discretion of management. Furthermore, no single disciplinary action shall set a precedent for any other disciplinary action relating to a safety or health violation that may be perceived to be of a like or

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similar nature. Nothing herein, shall alter right of the employee or employer to terminate employment at any time with or without cause or notice.

SYSTEM FOR COMMUNICATING WITH EMPLOYEES

At the time of initial employment and at other intervals, employees are notified through the Company's Safety Instructions, Company Safety Meetings, and by various other methods, written or oral, of applicable safe work practices and working conditions. All employees have the right and obligation to report any work-related injury or unsafe condition or hazard without fear of reprisal or threat of job security. Such information may be submitted in writing (signed or anonymous) or verbally to the employee's Foreman, supervisor, any member of management, or directly to the appropriate federal, state, or local governmental agency.

SYSTEM FOR IDENTIFYING AND EVALUATING HAZARDS

Workplace hazards are identified and evaluated by the jobsite Foreman or supervisor through daily job walks and periodic, but not less than weekly inspections of the workplace, review of information concerning potential safety and health hazards provided by state and federal OSHA, suppliers and manufacturers of materials and equipment, and the General Contractor or Owner. Hazards are identified by analysis of the steps involved in a work process and by reviewing accidents, injuries, or illnesses that have occurred in the workplace. Inspections and training are to be conducted whenever new substances, processes, procedures, or equipment are introduced that represent an occupational hazard; whenever the supervisor is made aware of a new or previously unrecognized hazard, and at frequencies determined by the level of hazard associated with the site or process. Inspection records, including the Foreman's Daily Log, shall include the date, the jobsite area or activity inspected, the person conducting the inspection, findings of the inspection, and any required actions, are retained in the Project Management job files, or elsewhere, for a minimum of three years.

INJURY & ILLNESS INVESTIGATION PROCEDURES

Occupational injuries and illnesses are documented on a Supervisor's Accident Investigation Report (see appendix B for Forms Supplement) and are reviewed by management to determine what tools, equipment, job site or building condition, etc., may have caused or contributed to the incident; what action of the affected employee caused or contributed to the injury or illness; and what action has been taken or will be taken to prevent recurrence. In cases where corrective action is required, the job site Foreman and the Department Superintendent are responsible for making such corrective action, and follow up is made to assure that appropriate action has been completed. Standardized forms are used to organize and document the investigation and completed actions.

SYSTEM FOR CORRECTING UNSAFE WORK CONDITIONS

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Any time that unsafe or unhealthy conditions, work practices, or work procedures are discovered, employees may be removed from the area if such is necessary due to an imminent hazard. Appropriate actions are immediately taken by the Foreman to correct the hazard and mitigate the potential damage to person or property. Procedures include documented investigation of the cause and/or source of the hazard, identification of corrective actions needed, assignment of persons responsible for the completion of specific remedial actions, and follow up for compliance. Training and/or retraining of affected employees is provided as applicable.

TRAINING AND INSTRUCTION PROCEDURES

Employees are trained in safe work practices at the time of the initial employment; when given new job assignments for which training was not previously given; when new substances, processes, procedures, or equipment are introduced that represent a new hazard; when the supervisor is made aware of a new or previously unrecognized hazard; at least every ten working days on each jobsite; and at other intervals designated by management. Such training may occur in groups or individually at Company safety meetings; by written communications, posters or booklets; and by other methods to provide instruction in a form readily understandable by the employee or groups of employees. Individual records of training, including dates of training, types of training, and the individual or organization which provided the training, are retained by the Superintendent or in the employee's personnel file for a minimum period of three years.

PROGRAM REVIEW

The Company Safety Officer and the Department Safety Officers shall meet together at least quarterly to review various aspects of this written program; to confirm adherence to this program at all levels; to investigate further any accidents or illnesses; to receive and review all employee complaints about safety matters; to review the details, including abatement, of all state authorities having jurisdiction or other safety-related inspections; to review all accident reports; and to make further recommendations to management regarding this program.

5. JOB SITE SAFETY

| | |
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GENERAL WORK ENVIRONMENT

All work areas must be kept clean and orderly, and must be adequately illuminated. Pits and floor openings must be covered or otherwise guarded.

When meals are eaten on the premises, they must be eaten in areas where there is no exposure to toxic materials or other health hazards.

All spilled materials or liquids must be cleaned up immediately. Work surfaces must be kept dry or appropriate means taken to assure that surfaces are slip-resistant.

Waste, scrap, and debris must be stored safely and removed from the work site regularly. Combustible dust must be cleaned up with a vacuum system, including overhead surfaces. Metallic or conductive dust must be kept away from electrical enclosures or equipment.

No intoxicating beverages, drugs or controlled substances of any kind are permitted on the jobsite, and drinking or use of drugs by employees during working hours is absolutely prohibited, with violators subject to immediate dismissal.

No firearms or other weapons are permitted on the jobsite. Fighting, horseplay or scuffling on the job is prohibited. Good housekeeping should be maintained in all work areas.

At least the minimum number of toilets and washing facilities required by CAL/OSHA must be provided. The facilities must be clean and sanitary.

WALKWAYS

Aisles and passageways are kept clear, and are marked as appropriate. Wet surfaces are covered with non-slip materials.

There are safe clearances for walking in aisles where motorized or mechanical handling equipment is operating. Materials and equipment are stored so that sharp projections do not protrude into the walkway.

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Changes in direction and elevation are readily identifiable. Adequate headroom is provided for the entire length of the walkway. Trip and head knocker hazards are clearly marked.

Guardrails are provided where walkways are 30 inches or more above the floor or the ground.

Bridges are provided over conveyors and other hazards.

SPRAYING AND COATING OPERATIONS

All spraying operations must be completed in approved locations or facilities. NO SMOKING is allowed in spray areas. Paint spray booths, dip tanks, and the like must be cleaned regularly.

Adequate ventilation must be assured before spray operations are started; drying spaces also must have adequate ventilation. When appropriate, approved respiratory equipment must be used during spraying operations.

The spray area must be free of hot surfaces and must be at least 20 feet from flames, sparks, operating electrical motors, and other ignition sources. Portable lamps used to illuminate spray areas are suitable for use in hazardous locations.

Spray areas must be kept clean of combustible residue. Solvents used for cleaning must have a flash point of 100 F or more. Covered metal waste cans are to be used for oily and paint-soaked waste.

Over-sprayed residue must be cleaned up and removed periodically. Plastic sheeting should be used to contain over-spray.

Fire sprinkler heads under the spray hood must be covered with a thin plastic bag to keep it operable, and must be changed periodically.

LIFTING AND ERGONOMICS

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Back injuries can happen quickly with a wrong move. Lifting and carrying objects can be safer if:

1. When lifting items from below arm level, bend your knees, not your back, to lower your body to the object.
2. Bring the load as close as possible to the body before lifting.
3. Grip firmly with your hands (not just fingers) and keep your arms and elbows tucked in for more strength.
4. Lift by letting your legs push you up, not your back.
5. Be sure you can see where you are going and move slowly enough to avoid bumping into other objects.
6. Do not twist your body while carrying heavy objects; twisting is a major cause of injury. If you need to change directions, turn with your feet first.
7. Make sure that you are physically able to perform the task.

Lifting is safest when you keep your back straight and your stomach muscles tight. Staying in good physical condition and getting proper exercise are also important.

Loads should be broken down to movable weights, routes planned, and legs used to do the work. If an object is too heavy, bulky or unwieldy, help should be obtained or a handcart or dolly used.

When two or more are carrying long material together, carry the material on the same shoulder and lift or lower in unison.

Whenever possible, work should be performed so that prolonged raising of the arms over the head is not required or so that the neck and shoulders do not have to be stooped.

Work should be performed in a position that eliminates eye strain and/or glare. Work should be performed in a way that pressure points on parts of the body (wrists, forearms, backs of thighs, etc.) are not compressed.

MATERIAL HANDLING

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Motorized vehicles and mechanized equipment used for loading, moving, and unloading material must be inspected daily prior to its first use.

Trucks and trailers should be shut off and brakes set or otherwise secured from moving prior to loading or unloading.

Containers of combustibles or flammables should always be stacked and supported sufficient to provide stability.

Pallets should be inspected before being loaded or moved.

Hooks with safety latches or other arrangements should be used when hoisting materials so that slings or load attachments will not accidentally slip off the hoist hooks.

Securing chains, ropes, chokers, or slings must be adequate for the job to be performed.

When hoisting material or equipment, provisions must be made to assure that no one will be passing under the suspended loads. The person directing the operation should be on the ground.

Guy lines should always be flagged where they cross any path or roadway. They should never be tied to a railroad track.

Load lines should be carefully inspected each time they are rigged and each time they are taken down. Damaged or defective rope or cable should be cut immediately to prevent further use.

Cable slings should be inspected regularly and destroyed if damaged or defective. Slings should be hung up when not in use. Slings should be protected from sharp corners on loads. Slings should never be jerked when moving a load; this greatly increases the load on a sling and can weaken it.

The driver may not remain in the cab of a truck; when it is being loaded with heavy materials or equipment.

VEHICLE SAFETY

Because vehicle accidents are a leading cause of work-related injuries and deaths, vehicle operation while in the course of your employment must display safe driving habits and not reflect exhibitions of speed or recklessness. Compliance with all local, state, and federal traffic laws is required.

Drive defensively at all times by continually watching for hazardous conditions, understanding how to defend against them, and taking action in time to avoid problems. Keep your eyes and attention on the road and others, and adjust your speed and driving to changing weather and

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traffic conditions.

Drive courteously. How you drive reflects entirely on the Company. Drivers who are reported for careless or discourteous driving, or who have chargeable accidents, can lose the privilege and benefit of driving a Company vehicle.

Driver's Licenses And Driving Records:

All employees who, as a part of their duties, have need to operate vehicles on public roads must hold a valid, properly classed driver's license and possess a driving record acceptable to management. Failure to do so may result in loss of driving privileges, change of assignment, or disciplinary action up to and including discharge. The Company reserves the right to check the DMV record of all drivers of Company vehicles.

Seat Belts:

Employees are required to wear seat belts at all times when operating or riding in an employer-owned vehicle and/or when operating or riding as a passenger in any other vehicle during the course of their employment.

Alcohol And Drugs:

The consumption of alcohol or drugs (even over-the-counter medications and prescriptions), can slow reactions, blur vision, reduce ability to determine distance, and impair judgment. It is, therefore, a violation of our safety policy for any employee to operate a vehicle with illegal drugs in his or her system or while impaired by alcohol, prescription drugs, or over-the-counter medications.

No persons are to be transported in the bed of a truck, nor on top of, nor beside material or equipment being transported.

All Company vehicles are to be equipped with operating lights, brakes, horns, mirrors, windshields and turn signals in good repair. All Company vehicles are to contain a fully-charged fire extinguisher of at least 4B:C rating.

VEHICLE AND EQUIPMENT FUELING

It is prohibited to fuel a vehicle, compressor, welder, or any other internal combustion engine while the engine is running.

Fueling operations must be done in such a manner that likelihood of spillage will be minimal. When spillage occurs during fueling operations, the spilled fuel must be washed away completely, evaporated, or other measures taken to control vapors before restarting the engine.

Fuel tank caps must be replaced and secured before starting the engine.

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Gasoline may not be handled or transferred to open containers, nor may it be transported in the passenger compartment or in the trunk of a vehicle.

Smoking, open lights, open flames, or sparking or arcing equipment are prohibited within 50 feet of fueling or fuel transfer operations.

Fueling operations are prohibited in buildings or other enclosed areas that are not specifically ventilated for this purpose.

Drivers are required to check the oil, water, and other lubricants every time they fuel.

SECURITY

To safeguard the premises and the welfare of all employees, Foremen should be alert to persons whose presence appears to be of a suspicious nature, not typically expected of an ordinary visitor. If you have doubts concerning the intentions of any person on the premises, contact the General Contractor, the Owner, the security service (if any), or take another employee along to confront them.

Keys to padlocks, storage lockers, buildings or offices are issued for the exclusive use of a specific employee and are not to be loaned to others are not to be duplicated.

All tools, equipment and materials are to be either with a worker or locked up. All tools are to be locked in a tool locker at the end of each shift. In addition to being locked inside a fence or building, high value portable equipment, such as welders, hole boring machinery, etc., are to be secured to a post or other stationary object by chains or other devices. Be especially careful about locking up before weekends and holidays.

If the construction site is on a military facility, the Project Manager will assure that employees comply with the vase security requirements. Employees must have required identification documents or badges and clearances required for the work.

FIRE PROTECTION

No smoking is allowed in areas involving the storage and/or use of hazardous, flammable, or combustible materials.

Fire extinguishers should not be obstructed and must be used as directed by the manufacturers' instructions. Standard classes of extinguishers are as follows:

- Class A -Ordinary combustible material fires.
- Class B - Flammable liquid, gas or grease fires.
- Class C - Energized-electrical equipment fires.

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The most practical type of extinguisher for construction is the all purpose ABC dry chemical powder type, although these are not as effective on class A fires as water. Dry chemical extinguishers are typically required to be inspected and serviced annually. Contact the Foreman to exchange any extinguisher which is out of date for a fresh one.

A fire extinguisher, rated at not less than 1B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or flammable gas are being used on a job site.

Standpipes and fire doors or shutters and associated counterweights must be unobstructed. Proper clearance must be maintained below sprinkler heads and they must be protected by metal guards when exposed to physical damage.

Combustible scrap, debris, and waste must be stored safely and removed from the work site promptly. Covered metal waste cans must be used for oily and paint-soaked waste. Accumulations of combustible dust must be routinely removed.

Flammable liquids must be kept in closed, fire-resistant containers when not in use or until removed from the work site.

All spills of flammable or combustible liquids must be cleaned up promptly.

Fire separators should be placed between containers of combustible or flammable material when stacked one upon another to assure their support and stability. While in storage, fuel gas cylinders and oxygen cylinders should be separated by a distance of 25 feet or by fire resistant banners.

All connections on drums and combustible liquid or vapor piping must be tight. Bulk drums of flammable liquids must be grounded and bonded to containers during dispensing.

The use of gasoline as a cleaning solvent is strictly forbidden. Open containers of gasoline are strictly forbidden. Only approved cleaners may be used to clean tools and equipment.

Wherever employees are welding or cutting with a torch, a fire extinguisher is to be located nearby. All welding carts are to be equipped with an appropriate fire extinguisher.

5.1 PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

Personal Protective Clothing 5-8

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| Hard Hats | 5-9 |
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| Respiratory Protection (Masks, Respirators, Breathing Devices) | 5-10 |
| Masks | 5-10 |

PERSONAL PROTECTIVE CLOTHING

Workers shall wear serviceable and suitable clothing. Good heavy work shoes should be worn on the job. Canvas or athletic soft shoes are prohibited. Steel toe safety shoes are required for company personnel and highly recommended for subcontractor employees. Foot protection meeting the requirements of ANSI Standard Z4.1-1967 must be worn by the equipment operator during tamping operations. Long sleeve shirts are recommended for welding, working with fiberglass, and other tasks.

Personal protective equipment and clothing must be maintained in a sanitary condition and ready for use. Personal protective clothing or equipment should be cleaned after it has been used, and maintained in good condition. Excessively loose clothing and loose long hair is a hazard for entanglement in equipment and is prohibited. Defective equipment will be replaced immediately.

FALL PROTECTION

Employees working from unguarded surfaces, above machinery, over water, on steep slopes, or otherwise subject to falls, should be secured by safety belts, harnesses and lifelines, or be protected by safety nets. This also applies to employees who are in the habit of standing on the rails of scissor-lifts or the top two rungs of a ladder.

Lifelines, safety belts, and lanyards must be used only for employee safeguarding and must be removed from service if subjected to in-service loading. Lifelines and safety belt lanyards and associated hardware must have a breaking strength of 5,400 pounds and be attached above the point of operation to an anchorage capable of supporting 5,400 pounds.

Safety nets extending 8 feet beyond the edge of the work surface will be installed when workplaces are more than 25 feet above the ground and the use of ladders, scaffolds, temporary floors, safety lines and safety belts is impractical. Such nets must provide sufficient clearance to prevent contact with surfaces below.

HEAD PROTECTION (HARDHATS)

Hard hats (helmets) will be provided and must be worn at all times during working hours on construction sites or where there is a hazard of falling or flying objects or electrical shocks. Hard

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hats should be inspected periodically for damage to the shell and suspension system. Helmets for the protection of employees against these hazards must meet the following specifications:

| | |
|------------------------|-------------------|
| Impact and Penetration | ANSI Z89.1 – 1969 |
| High Voltage | ANSI Z89.2 – 1971 |

GLOVES

Appropriate protective gloves will be furnished and should be worn when working with sheet metal, fiberglass, caustics, acids, solvents, concrete or cement, pipe dope, corrosive liquids or chemicals, and welding operations. Hand lacerations are the most common minor injuries.

EYE AND FACE PROTECTION

Safety glasses, goggles, or full face shields meeting ANSI Standard Z87.1-1968 will be furnished and must be worn at all times when grinding metals, chipping, cutting, caulking, reaming, drilling, riveting, cutting concrete, welding or cutting, and for all other operations involving flying particles, sparks, chips, or corrosive materials, or where there is a risk of eye injuries such as punctures, abrasions, burns or particles in the eye, the second most common minor injury. Eye washes, including the type contained in jobsite first aid kits, should be available when there is potential exposure to the eyes from corrosive materials. Employees exposed to laser beams will be provided goggles that protect against the wavelength involved. Employees whose vision requires corrective lenses will be protected by spectacles whose protective lenses provide optical correction, or by an acceptable face shield over their spectacles. Limitations on the protection capability of the eye protection will be communicated to the employees.

EAR PLUGS

Ear plugs or coverings will be furnished and must be used when sound levels are such that ear damage or hearing loss could occur, or the noise level exceeds the Cal/OSHA noise standards. Plain cotton is not an acceptable protective device.

RESPIRATORY PROTECTION (MASKS, RESPIRATORS, BREATHING DEVICES)

Approved filter masks, respirators, or breathing devices of the proper type should be worn whenever toxic dust, fumes, gasses or other harmful atmospheres are present. Asbestos removal, the use of some solvents, and some spray painting and coating processes frequently require the

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use of respirators.

Subcontractors using respirators shall have implemented a Respiratory Protection Program. Employees will be trained for the proper use of respirators and proper fit. Respirators will be inspected by employees before each use.

Employees should not enter manholes, underground vaults, chambers, tanks, silos or similar places that receive little ventilation or have less than 20% oxygen, unless it has been determined by instrument tests that there are no flammable or toxic gases present and that the oxygen content is adequate. Such areas are to be thoroughly ventilated. Self contained or air-supplied breathing apparatus should be utilized if the environment cannot be made safe and is considered immediately hazardous to life or health. Compressed breathing air shall at least meet the requirements of Grade D breathing air - ANSI specification G-7.1-1989. Entry into such environments must be made in compliance with confined space entry procedures.

5.2 FIRE PROTECTION/PREVENTION

| | |
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| Fire Alarm Devices | 5-12 |
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| Ignition Hazards..... | 5-12 |

GENERAL REQUIREMENTS

The employer will prepare a fire protection plan that applies to all phases of the demolition and construction work, and will provide sufficient firefighting equipment as specified in the plan. As fire hazards occur, there shall be no delay in providing the necessary equipment.

Access to available firefighting equipment shall be maintained at all times.

Firefighting equipment, provided by the employer, shall be conspicuously located.

Firefighting equipment shall be periodically inspected and maintained in operating condition.

Defective equipment shall be immediately replaced.

Employees will be trained periodically in the identification of fire hazards of materials and processes in use, and the use of Company provided firefighting equipment.

As warranted by the project, the employer shall provide a trained and equipped firefighting organization (Fire Brigade) to assure adequate protection to life.

WATER SUPPLY

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A temporary or permanent water supply, of sufficient volume, duration, and pressure, required to properly operate the firefighting equipment shall be made available as soon as combustible materials accumulate.

PORTABLE FIREFIGHTING EQUIPMENT

A fire extinguisher, rated not less than 2A, will be provided for each 3,000 square feet (or fraction) of the protected building area. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.

A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, providing it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines must be mounted on conventional racks or reels. Enough hose racks or reels will be provided so that one hose stream can be applied to all points in the area.

One or more fire extinguishers, rated not less than 2A, will be provided on each floor. In multistory buildings, at least one fire extinguisher will be located adjacent to a stairway.

A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.

Only fire extinguishers that have been listed or approved by a nationally recognized testing laboratory may be used to meet the fire extinguisher requirements.

FIRE HOSE AND CONNECTIONS

One hundred feet, or less, of 1 1/2-inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute, may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.

SPRINKLER PROTECTION

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If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.

FIRE ALARM DEVICES

An alarm system, e.g., telephone system, siren, etc., will be provided by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

FIRE CUTOFFS

Fire walls and exit stairways, required for the completed buildings, shall be given construction priority. Fire doors, with automatic closing devices, shall be hung on openings as soon as practicable.

Fire cutoffs shall be retained in buildings undergoing alterations or demolition until construction necessitates their removal.

IGNITION HAZARDS

Internal combustion engine powered equipment shall be located so that the exhausts are well away from combustible materials. When the exhausts are piped to outside the building under construction, a clearance of at least 6 inches shall be maintained between such piping and combustible material.

Smoking is prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No Smoking or Open Flame."

Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet. Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials

The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.

Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure. All materials shall be stored, handled, and piled with due regard to their fire characteristics.

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The following clearances shall be maintained between the stored material and location under consideration:

| Location | Minimum Clearance |
|--|-------------------|
| Top of stored material to sprinkler deflectors | 36 inches |
| Around lights and heating units | 36 inches |
| Path of travel of fire doors | 24 inches |
| Fire door opening | 36 inches |

5.3 SIGNS, SIGNALS, AND BARRICADES

| | |
|---|------|
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| Crane and Hoist Signals..... | 5-14 |
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ACCIDENT PROTECTION SIGNS AND SYMBOLS

The following signs and symbols are required when a hazard exists and shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazards no longer exist.

Danger signs – to be used only where an immediate hazard exists.

Caution signs - to be used only to warn against potential hazards or to caution against unsafe practices.

Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording. Caution signs shall have yellow as the predominating color; black upper panel and borders; yellow lettering of "caution" on the black panel; and the lower yellow panel for additional sign wording. Black lettering shall be used for additional wording.

INSTRUCTIONAL SIGNS

Exit signs, when required, shall be lettered in legible red letters, not less than 6 inches high, on a white field and the principal stroke of the letters shall be at least three-fourths inch in width.

Safety instruction signs, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.

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DIRECTIONAL SIGNS

Directional signs, other than automotive traffic signs shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background. Construction areas shall be posted with legible traffic signs at points of hazard.

Traffic control signs or devices used for protection of construction workmen shall conform to American National Standards Institute D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways.

ACCIDENT PREVENTION TAGS

Accident prevention tags are used as a temporary means of warning employees of an existing hazard such as defective tools, equipment, etc. and may not be used in place of, or as a substitute for, accident prevention signs.

FLAGMEN

When operations are such that signs, signals, and barricades do not provide the necessary protection on or adjacent to a highway or street, flagmen or other appropriate traffic controls shall be provided. Hand signaling by flagmen shall be by use of red flags at least 18 inches square or sign paddles, and in periods of darkness, red lights. Flagmen shall be provided with and shall wear a red or orange warning garment while flagging. Warning garments worn at night shall be of reflectorized material.

CRANE AND HOIST SIGNALS

Standard hand signals for cranes and hoists will be used.

BARRICADES

Barricades for protection of employees shall conform to the portions of the American National Standards Institute D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways, relating to barricades.

5.4 MATERIALS HANDLING, STORAGE, USE AND DISPOSAL

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EARTHMOVING EQUIPMENT

Seat Belts

The following types of earthmoving equipment: scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment must have seat belts that meet the requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment. Seat belts need not be provided for equipment which is designed only for standup operation. Seat belts need not be provided for equipment which does not have roll-over protective structure (ROPS) or adequate canopy protection.

Brakes

Earthmoving equipment shall have a service braking system capable of stopping and holding the equipment fully loaded.

Brake systems for self-propelled rubber-tired off-highway equipment manufactured after January 1, 1972 shall meet the applicable minimum performance criteria set forth in the following Society of Automotive Engineers Recommended Practices:

| | |
|------------------------------|----------------|
| Self-Propelled Graders | SAE J236-1971. |
| Trucks and Wagons | SAE J166-1971. |
| Front End Loaders and Dozers | SAE J237-1971. |

Audible alarms

Bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, are to be equipped with horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction.

Earthmoving or compacting equipment which has an obstructed view to the rear may not be used in reverse gear unless the equipment has an operation as reverse signal alarm heard above the surrounding noise level. An employee may observe and signal that it is safe to back up.

Scissor points. Scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, shall be guarded.

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Excavating and other equipment

Seat belts are required for the tractor operators when seated in the normal seating arrangement for tractor operation, even though back-hoes, breakers, or other similar attachments are used on these machines for excavating or other work.

LIFT TRUCKS (FORK LIFTS)

No modifications or additions which affect the capacity or safe operation of the equipment are permitted without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.

Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob be mounted within the periphery of the wheel.

Unauthorized personnel are not permitted to ride on powered industrial trucks. A safe place to ride will be provided where riding on trucks is authorized.

In general, a lift truck should not be used to lift personnel. If circumstances require it, a truck equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks may be used to lift personnel. In such instances the following additional precautions must be taken for the protection of personnel being elevated:

- Use of a safety platform firmly secured to the lifting carriage and/or forks
- Means by which personnel on the platform can shut off power to the truck.
- Protection from falling objects as indicated by the operating conditions

POWERED INDUSTRIAL TRUCK (FORK LIFT) OPERATOR TRAINING

The employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the Company's training and evaluation

Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the required training.

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Operator Training Program

Trainees may operate a powered industrial truck only:

- Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and
- Where such operation does not endanger the trainee, other employees, or others.

Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.

All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

Training program content

Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace; or when the employee can demonstrate proficiency from prior training and experience.

Truck-related topics:

- Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;
- Differences between the truck and the automobile;
- Truck controls and instrumentation: where they are located, what they do, and how they work;
- Engine or motor operation;
- Steering and maneuvering;
- Visibility (including restrictions due to loading);
- Fork and attachment adaptation, operation, and use limitations;
- Vehicle capacity;
- Vehicle stability;

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- Any vehicle inspection and maintenance that the operator will be required to perform;
- Refueling and/or charging and recharging of batteries;
- Operating limitations;
- Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

Workplace-related topics:

- Surface conditions where the vehicle will be operated;
- Composition of loads to be carried and load stability;
- Load manipulation, stacking, and unstacking;
- Pedestrian traffic in areas where the vehicle will be operated;
- Narrow aisles and other restricted places where the vehicle will be operated;
- Hazardous locations where the vehicle will be operated;
- Ramps and other sloped surfaces that could affect the vehicle's stability;
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

Refresher Training and Evaluation

Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely. Refresher training in relevant topics shall be provided to the operator when:

- The operator has been observed to operate the vehicle in an unsafe manner;
- The operator has been involved in an accident or near-miss incident;
- The operator has received an evaluation that reveals that the operator is not operating the truck safely;
- The operator is assigned to drive a different type of truck; or

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- A condition in the workplace changes in a manner that could affect safe operation of the truck.
- An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

Certification

The employer shall certify that each operator has been trained and evaluated as required by this paragraph (I). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

Truck operations

- Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.
- No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.
- Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.
- The employer shall prohibit arms or legs from being placed between the uprights of the mast or outside the running lines of the truck.
- When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels must be blocked if the truck is parked on an incline.
- A powered industrial truck is unattended when the operator is 25 ft. or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle and it is not in his view.
- When the operator of an industrial truck is dismounted and within 25 ft. of the truck still in his view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.
- A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks shall not be used for opening or closing freight doors.
- Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semitrailer during loading or unloading when the trailer is not coupled to a tractor. The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.
- There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.

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- A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

MATERIAL STORAGE

Materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.

Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads shall not be exceeded.

Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.

When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

Material stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the material stored.

Each employee required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with personal fall arrest equipment meeting the requirements of Subpart M of this part.

Noncompatible materials shall be segregated in storage.

Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.

Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

Brick stacks shall not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level.

When masonry blocks are stacked higher than 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.

Used lumber shall have all nails withdrawn before stacking.

Lumber shall be stacked on level and solidly supported sills.

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Lumber shall be so stacked as to be stable and self-supporting.

Lumber piles shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high.

Structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent spreading or tilting.

"Housekeeping." Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary.

DOCKBOARDS (BRIDGE PLATES)

Portable and powered dockboards shall be strong enough to carry the load imposed on them.

Portable dockboards shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping.

Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.

Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position.

RIGGING EQUIPMENT FOR MATERIAL HANDLING

Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

Rigging equipment shall not be loaded in excess of its recommended safe working load. The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

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Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be marked to indicate the safe working loads and shall be proof-tested prior to use to 125 percent of their rated load.

Each day before being used, slings and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

In addition to the inspection required by other paragraphs of this section, a thorough periodic inspection of slings in use shall be made on a regular basis, to be determined on the basis of (A) frequency of sling use; (B) severity of service conditions; (C) nature of lifts being made; and (D) experience gained on the service life of slings used in similar circumstances. Such inspections shall in no event be at intervals greater than once every 12 months.

DISPOSAL OF WASTE MATERIALS

Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used. When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. Signs warning of the hazard of falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

All scrap lumber, waste material, and rubbish shall be removed from the immediate work area as the work progresses. Disposal of waste material or debris by shall comply with local regulations.

All solvent waste, oily rags, and flammable liquids shall be kept in fire resistant covered containers until removed from worksite.

5.5 HAND AND SHOP TOOLS AND EQUIPMENT

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HAND TOOLS AND EQUIPMENT

All hand tools and equipment used by employees must be in good condition. Worn or bent, mushroomed, burned or broomed tools must be replaced.

Broken tool handles must be replaced promptly. Appropriate handles must be used on files and similar tools. Tool handles must be wedged tightly in the head of all tools.

Tool cutting edges must be kept sharp so the tool will move smoothly without binding or skipping. Tools must be stored in a dry, secure location.

Appropriate safety glasses, goggles, or face shields must be used while using hand tools or equipment that might produce flying materials or be subject to breakage.

HAMMERS

The appropriate hammer must be used for the job; one hammer must never be used to strike a second hammer in order to gain additional striking power. Hammers should be grasped firmly, close to the end of the handle; objects should be struck with the full face of the hammer. Broken or fractured handles must be replaced promptly. Hammers with loose heads must be repaired before use; those with chipped or mushroomed faces should be discarded. Do not use a wrench for a hammer.

PLIERS/CUTTERS/PRYBARS

Plastic or vinyl covered pliers handles are not intended to act as insulation; they must not be used on live electrical circuits. Pliers or cutters should be used for cutting hardened wire only if they were designed for that purpose. Cuts should always be made at right angles. Prybars must never be used as a chisel, punch, or hammer.

WRENCHES

The proper wrench must be used for the job; a pipe is never to be used as an extension on a wrench handle. If possible, always pull toward you with the wrench handle and adjust your stance to prevent a fall if something lets go. Never use a hammer on any wrench and never use a wrench as a hammer. Turn in any wrench with broken or battered points.

SOCKETS AND RATCHETS

Select the right size socket for the job; never cock any wrench or socket. Sockets should be kept clean and those showing cracks or wear should be discarded. Only impact sockets should be used with air or electric impact wrenches, not hand sockets. Approved eye protection must be worn when using power or impact wrenches.

Ratchet mechanisms should be cleaned and lubricated periodically with a light grade oil. A ratchet head should be supported when using socket extensions. When breaking loose a fastener, a small amount of pressure should be applied as a test to be sure gear wheel is engaged with the pawl. A hammer should never be used on a ratchet nor should a pipe be used as a handle extender.

PUNCHES & CHISELS

A punch or chisel with a chipped or mushroomed end must not be used; mushrooms should be dressed with a file. Punches and chisels should be held with a tool holder if possible. When using a chisel on a small piece, the piece should be clamped firmly in a vise and the chipping made toward the stationary jaw.

SCREWDRIVERS

The proper type of screwdriver must be used for the job and the tip matched to the fastener and not interchanged. Screwdrivers must not be used for prying, punching, chiseling, scoring, or scraping. Screwdriver handles are not intended to act as insulation and must not be used on live electrical circuits. Screwdrivers with rounded edges should be redressed with a file.

FILES

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Handles are to be used to cover pointed ends (tang) of hand files.

WHEELBARROWS

Do not push a wheelbarrow tipped with the handles in a vertical position.

GRINDERS

Cleanliness must be maintained around grinders. The adjustable tongue on the top side of a grinder must be used and kept to within 1/4 inch of the wheel. Side guards on grinders must cover the spindle, nut, and flange and 75 percent of the wheel diameter. The work rest must be used and kept to within 1/8 inch of the wheel.

Bench and pedestal grinders must be permanently mounted before being used and must be connected to their electrical supply system with metallic conduit or other permanent wiring method. Each grinder is effectively grounded and has an individual on/off switch.

Safety glasses or face shields must be worn when grinding.

New abrasive wheels must be visually inspected and ring tested before mounting. The RPM rating of the wheel must be compatible with the RMP rating of the grinder motor.

NOTE that safety glasses should be used with most hand tools. A dust mask is to be used if cutting or grinding operations produce excessive amounts of dust and the grinder is not equipped with a dust collection system.

POWER OPERATED HAND TOOLS

Power tools must be used with the correct shield, guard, or attachment as recommended by the manufacturer. All moving parts should operate freely and precisely.

Safety guards on grinders, saws, and similar equipment must be in place during operation. Portable circular saws must be equipped with guards above and below the base shoe. Circular saw guards should be checked so as to assure that they are not wedged up, thus leaving the lower portion of the blade unguarded.

Portable equipment with rotating or moving parts must be used in such a manner as to prevent physical contact during operation. Secure the work with a clamp or vise. Don't force the tool.

All cord-connected, electrically operated tools and equipment must be effectively grounded or of the approved double insulated type. Do not use the cord to lower or pick up the tool. Never pull the cord from the socket. If adapters are used, they must also be grounded. Never remove the

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third prong.

Guards must be in place over all belts, pulleys, chains, and sprockets on all portable tools and equipment.

Portable fans must be guarded with grates or screens having openings of 1/2 inch or less. Do not lift or lower portable tools by their electric cord or air line. Never throw or drop tools, material or equipment from one floor to the next; use a hand line.

Pneumatic and hydraulic hoses on power-operated tools must be checked regularly for deterioration or damage. The tools should be secured to the hose or whip by a positive means to prevent accidental disconnection.

Only recommended accessories with proper capacity ratings may be used on portable power tools. Air pressure ratings must not be exceeded on any power tool.

The air supply line to air hammers should be disconnected before attaching bits. Bits should be against a work surface before air hammers are operated. Safety clips or retainers should be installed to prevent nails or staples from being accidentally ejected.

Keep electrical equipment cords coiled when not in use. Position cords to avoid being run over by vehicles or heavy equipment.

Electric equipment should be protected from rain, steam, excessive moisture and excessive dust, and should never be placed on wet ground. Store tools when not being used.

PNEUMATIC POWER TOOLS

Air tools must never be pointed at oneself or at another person. A safety device that prevents the tool from accidentally firing fasteners is required on pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed. The safety devices should prevent the tool from ejecting fasteners when the muzzle of the tool is not in contact with the work surface.

Secure pneumatic power tools to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected. Install and maintain safety clips or retainers on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled. Do not use hoses for hoisting or lowering tools and do not exceed the manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings.

Compressed air should not be used for cleaning purposes. It may be used only when the pressure is reduced to less than 10 psi and then only with effective chip guarding and personal protective equipment.

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Airless spray guns that atomize paints and fluids at high pressures (1,000 psi or more) must be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. A diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator is also acceptable.

Abrasive blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

FUEL POWERED TOOLS

Stop and shut off the ignition of fuel powered tools while they are being refueled, serviced, or maintained. Do not use fuel powered tools in enclosed spaces where high concentrations of toxic gases can accumulate.

HYDRAULIC POWER TOOLS

Use fire-resistant fluids in hydraulic powered tools. Don't exceed the manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings.

POWDER-ACTUATED TOOLS

Powder-actuated tools may be operated only by employees who have been trained in the operation of the particular tool and carry a valid certification. Employees must wear appropriate personal protective equipment.

Examine and test the tool each day before loading to see that safety devices are in proper working condition. Test the tool as recommended by the manufacturer.

Do not load powder-actuated tools until just prior to use. Put the tool away immediately after using it and do not leave it unattended.

Don't try to drive fasteners into very hard or brittle materials such as cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.

Don't drive fasteners into soft materials unless such materials are backed by something that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

Don't drive fasteners into a spalled area caused by an unsatisfactory fastening.

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Do not use powder-actuated tools in an explosive or flammable atmosphere.

All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

Purchaes and use only powder-actuated tools that meet applicable requirements of ANSI Standard, A10.3-1970, Safety Requirements for Explosive-Actuated Fastening Tools.

AIR RECEIVERS

Install air receivers so that all drains, handholes, and manholes are easily accessible. Under no circumstances may an air receiver be buried or located in an inaccessible place.

Install a drain pipe and valve at the lowest point of every air receiver to provide for the removal of accumulated oil and water. Adequate automatic traps may be installed in addition to drain valves.

Open the drain valve on the air receiver periodically to drain it and prevent the accumulation of excessive amounts of liquid in the receiver. Keep the inlet and piping systems free of oil and other flammable substances.

Air receivers must be equipped with an indicating pressure gage (so located as to be readily visible) and with one or more spring-loaded safety valves.

The total relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent.

No valve of any type can be between the air receiver and its safety valve or valves. Make sure there are no obstructions to safety valves, indicating devices and controlling devices, and periodically test safety valves to determine whether they are in good operating condition.

JACKS-LEVER AND RATCHET, SCREW, AND HYDRAULIC

Load

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Do not attempt to exceed the manufacturer's rated capacity, which is marked on the jack. Make sure the jack has a positive stop to prevent overtravel.

Blocking

If necessary, provide a firm foundation by blocking or cribbing the base of the jack. Again, if necessary, where there is a possibility of slippage of the metal cap of the jack, place a wood block between the cap and the load.

Operation and maintenance

After the load has been raised, it shall be cribbed, blocked, or otherwise secured at once.

Inspect each jack thoroughly at times not less frequent than the following:

- With constant or intermittent use at one locality, once every 6 months,
- With jacks sent out for special work, when sent out and when returned,
- Immediately after a jack has been subjected to abnormal load or shock

Tag and do not use jacks that are out of order

A good workman knows and cares for his tools. –

5.6 WELDING, CUTTING, AND BRAZING

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WELDING, CUTTING, AND BRAZING

Acetylene gas is hazardous, even when diluted with air. Take care not to inhale it. Only authorized and trained personnel are permitted to use welding, cutting, or brazing equipment. Follow the operating instructions for the equipment.

Long sleeves, suitable gloves and suitable goggles or helmet shall be worn. Precautions must be taken to prevent the mixture of air or oxygen with flammable gases, except at the tip of a standard torch.

Only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) may be used.

Regulators must be removed and valve-protection caps put in place before moving or storing cylinders unless they are on special trucks.

Cylinders must have keys, handles, or non-adjustable wrenches on stem valves when in service.

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Cylinders, cylinder valves, couplings, regulators, hoses, and apparatus must be kept free of oily or greasy substances.

Liquefied gases, such as propane or butane, must be stored and shipped valve-end up with valve covers in place.

A fuel-gas cylinder valve must never be cracked near a source of ignition.

Before a regulator is removed, the valve must be closed and gas released from the regulator.

Red is used to identify an acetylene hose and green is used for the oxygen hose. Black is used for an inert gas and air hose.

Pressure-reducing regulators must be used only for the gas and pressures for which they are intended.

The open circuit (No Load) voltage of arc welding and cutting machines must be as low as possible and not in excess of the recommended limits.

Under wet conditions, automatic controls for reducing no load voltage must be used. The machine frame and safety ground connections of portable welding machines must be checked periodically.

Electrodes must be removed from the holders of welders when not in use. Inspect hoses and connections frequently for leaks and signs of wear. Repair immediately.

Suitable fire extinguishing equipment must be available for immediate use at the site of welding operations. All welding carts must have an attached fire extinguisher.

Electric power to a welder must be shut off when no one is in attendance.

Welders may not coil or loop welding electrode cable round their bodies.

Wet welding machines must be thoroughly dried and tested before being used. Work and electrode lead cables must be frequently inspected for wear and damage, and replaced when needed.

The means for connecting cable lengths must have adequate insulation.

When the object to be welded cannot be moved and fire hazards cannot be removed, shields must be used to confine heat, sparks, and slag. Be especially conscious of fire hazards, boxes, scrap, etc., on the floor below.

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Fire watchers must be assigned when welding or cutting is performed in locations where a serious fire might develop.

Combustible floors must be kept wet, covered by damp sand, or protected by fire-resistant shields.

Welding curtains should be used to protect the eyes of others.

When floors are wet down, procedures must be taken to protect personnel from possible electrical shock.

When welding is done on metal walls, precautions must be taken to protect combustibles on the other side.

Before cutting or welding, used drums, barrels, tanks, and other containers must be so thoroughly cleaned that no substances remain that could explode, ignite, or produce toxic vapors.

Employees exposed to the hazards created by welding, cutting, or brazing operations must be protected with personal protective equipment and clothing. Eye protection helmets, hand shields, and/or goggles that meet appropriate standards must be used during all welding, cutting, and brazing operations.

There must be adequate ventilation where welding or cutting is performed.

WORKING IN CONFINED SPACES

No welding, brazing, burning or even entering enclosed tanks, vessels, manholes, underground vaults, or other confined places, is permitted until environmental monitoring tests have been to determined that no possibility of explosion exists and a means has been provided for quick removal of welders in case of an emergency. Entry into confined spaces must be done in compliance with the confined space entry provisions given in Section 5.16

COMPRESSED GAS CYLINDERS

Cylinders must be legibly marked to clearly identify the gas contained.

Compressed gas cylinders must be stored in areas and protected from external heat and sources of ignition. They must be located or stored in areas where they will not be damaged by passing or falling objects or subject to tampering by unauthorized persons and be stored or transported in a manner to prevent them from creating a hazard by tipping, falling, or rolling.

Cylinders containing liquefied fuel gas must be stored or transported in a position so that the

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safety relief device is always in direct contact with the vapor space in the cylinder.

All valves must be closed off before a cylinder is moved or stored and when the cylinder is empty. Valve protectors always must be placed on cylinders not in use.

All types of gas cylinders must be checked periodically, including a close inspection of the of the cylinder (including the bottom for corrosion, general distortion, cracks, rust, or any other defect that might indicate a weakness or render it unfit for service.

There shall be no attempt to transfer gas from one cylinder to another, nor to mix different gases in a cylinder.

Compressed gas cylinders must be regularly examined for obvious signs of defects, deep rusting, or leakage.

Care must be used in handling and storage of cylinders, safety valves, etc., to prevent damage.

Cylinders must be kept away from sources of heat. Cylinders must be kept away from elevators, stairs, gangways or floor openings or edges.

It is prohibited to use cylinders as rollers or supports.

Empty cylinders must be appropriately marked MT or EMPTY, their valves closed, and, where possible, stored separately from full cylinders. Care must be taken not to drop or strike cylinders.

When transporting, use straps and two pieces of angle stock, or some other effective means, to secure cylinders. Larger cylinders should be transported horizontally in the bed of a truck, not upright, and secured against sliding forward (when stopping).

5.7 ELECTRICAL SAFETY

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ELECTRICAL SAFETY

Electricians must have had training in Cal/OSHA electrical safety orders. Contractors and subcontractors are required to comply with Cal/OSHA regulations. Employees who regularly work around energized electrical equipment or lines must have CPR training.

All employees are required to report as soon as practical any obvious hazard to life or property observed in connection with electrical equipment or lines. Preliminary inspections and/or appropriate tests must be made to determine what conditions exist before starting work on electrical equipment or lines.

All machines, equipment, appliances, portable electrical tools, and extension cords must be grounded or have a grounding conductor as applicable. Multiple plug adapters are prohibited.

In wet or damp locations, electrical tools and equipment must be appropriately protected.

The location of electrical power lines and cables (overhead, underground, underfloor, other side of walls, etc.) must be determined before digging, drilling, or similar work is begun.

The use of metal ladders and metal measuring tapes is prohibited in areas where they or the person using them could come in contact with energized parts of equipment, fixtures, or circuits.

All disconnecting means must be opened before fuses are replaced.

Employees are prohibited from working alone on energized lines or equipment over 600 volts. Only authorized personnel are permitted to make electrical repairs. Electrical equipment should be disconnected before attempting repairs with exceptions only after approval of the safety officer.

Ground-fault circuit interrupters are to be used on all spider boxes and other temporary circuits.

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All extension cords are to be inspected quarterly to insure proper grounding. Each cord shall be color-coded with tape to indicate the last inspection. As an alternative, grounding inspections are not required, providing that wherever a tool or appliance is plugged into a circuit, it is connected to a circuit breaker device at the point of connection.

Interior wiring systems include provisions for grounding metal parts of electrical raceways, equipment, and enclosures.

Electrical raceways and enclosures are securely fastened in place

Energized parts of electrical circuits and equipment are guarded against accidental contact by approved cabinets or enclosures

Sufficient access and working space is provided and maintained about electrical equipment to permit ready and safe operations and maintenance

Unused openings (including conduit knockouts) in electrical enclosures and fittings are closed with appropriate covers or plates.

Disconnecting switches for electrical motors in excess of two horsepower are capable of opening the circuit when the motor is in a stalled condition without exploding. (Switches must be rated equal to or in excess of the motor power rating.

Low voltage protection is provided in the control device of motors driving machines or equipment which could cause injury from inadvertent starting.

Each motor disconnecting switch or circuit breaker is located within sight of the motor control device.

Each motor is located within sight of its controller, or the controller disconnecting means is capable of being locked in the open position, or a separate disconnecting means is installed in the circuit within sight of the motor.

CONDUCT OF ELECTRICAL WORK

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cable to be cut must be positively identified and de-energized prior to performing each cut.

Positive cable identification must be made prior to submitting any outage request for electrical systems.

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The Safety Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cutting remotely.

When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible.

Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter.

When work requires Contractor to work near high voltage energized circuits as defined by the NFPA 70 personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. Insulating blankets, hearing protection, and switching suits may be required, depending on the specific job and as delineated in the Contractor AHA.

WIRING DESIGN AND PROTECTION

A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.

A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.

GROUND-FAULT PROTECTION

Ground-fault circuit interrupters or an assured equipment grounding conductor program shall be used to protect employees on our construction sites. Each 120-volt, single-phase 15- and 20-ampere receptacle outlet on construction sites, which are not a part of the permanent wiring of the building or structure, and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

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Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:

A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying by the Assistant Secretary and any affected employee.

The employer shall designate one or more competent persons (as defined in 1926.32(f)) to implement the program.

Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:

- All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.
- Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

All required tests shall be performed:

- Before first use;
- Before equipment is returned to service following any repairs;
- Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and
- At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

Tests performed as required above shall be recorded. This test record shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the Assistant Secretary and any affected employee.

OUTSIDE CONDUCTORS AND LAMPS - 600 VOLTS OR LESS

Conductors supported on poles shall provide a horizontal climbing space not less than the following:

Power conductors below communication conductors-30 inches (762 mm).

Power conductors alone or above communication conductors: 300 volts or less-24 inches (610 mm); more than 300 volts-30 inches (762 mm).

Communication conductors below power conductors: with power conductors 300 volts or less-24 inches (610 mm); more than 300 volts-30 inches (762 mm).

Clearances

Open conductors shall conform to the following minimum clearances:

| Location | Vertical Clearance |
|---|--------------------|
| Above finished grade, sidewalks, and platforms or projections | 10 feet |
| Above areas with vehicular traffic other than trucks | 12 feet |
| Above areas subject to truck traffic | 15 feet |
| Building openings (doors, windows, fire escapes) | 3 feet |
| Over roofs accessible to employees on foot (highest point) | |
| Insulated | 8 feet |
| Covered | 10 feet |
| Bare | 15 feet |
| Over roofs accessible to vehicle traffic | 18 feet |
| Over roofs not normally accessible | 3 feet |

Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches (102 mm) in 12 inches (305 mm), the clearance from roofs shall be at least 3 feet (914 mm), or

Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet (1.22 m) of the overhang portion of the roof and they are terminated at a through-the-roof raceway or support, the clearance from roofs shall be at least 18 inches (457 mm).

Location of outdoor lamps. Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a

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disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

Services - disconnecting means

Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

Simultaneous opening of poles. Each service disconnecting means shall simultaneously disconnect all ungrounded conductors.

Services over 600 volts, nominal. The following additional requirements apply to services over 600 volts, nominal.

- Guarding. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.
- Warning signs. Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.

Over current protection

600 volts, nominal, or less. The following requirements apply to over current protection of circuits rated 600 volts, nominal, or less.

Protection of conductors and equipment. Conductors and equipment shall be protected from over current in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.

Grounded conductors. Except for motor-running overload protection, over current devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

Disconnection of fuses and thermal cutouts. Except for devices provided for current-limiting on the supply side of the service disconnecting means, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the over current device.

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Location in or on premises. Over current devices shall be readily accessible. Over current devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitable material.

Arcing or suddenly moving parts. Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.

Circuit breakers

Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.

Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.

Over 600 volts, nominal. Feeders and branch circuits over 600 volts, nominal, shall have short-circuit protection.

Portable and vehicle-mounted generators

Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:

- The generator supplies only equipment mounted on the generator and/or cord- and plug-connected equipment through receptacles mounted on the generator, and
- The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

Vehicle-mounted generators. Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

- The frame of the generator is bonded to the vehicle frame, and
- The generator supplies only equipment located on the vehicle and/or cord- and plug-connected equipment through receptacles mounted on the vehicle or on the generator, and
- The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame, and

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- The system complies with all other provisions of this section.
- Neutral conductor bonding. A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.
- Conductors to be grounded. For AC premises wiring systems the identified conductor shall be grounded.

Grounding connections

Grounded system. For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

Ungrounded systems. For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

Grounding path. The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

Supports, enclosures, and equipment to be grounded

Metal enclosures for service equipment shall be grounded.

Fixed equipment. Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

- If within 8 feet (2.44 m) vertically or 5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.
- If located in a wet or damp location and subject to employee contact.
- If in electrical contact with metal.
- If in a hazardous (classified) location.

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- If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.

If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:

- Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;
- Metal frames of electrically heated appliances which are permanently and effectively insulated from ground; and
- The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.

Equipment connected by cord and plug. Under any of the conditions described in paragraphs in this section, exposed noncurrent-carrying metal parts of cord- and plug-connected equipment which may become energized shall be grounded:

- If in a hazardous location.
- If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.

Cord- and plug-connected equipment used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;

Portable and mobile X-ray and associated equipment;

Tools likely to be used in wet and/or conductive locations;

Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

Nonelectrical equipment. The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over 1 kV between conductors.

Methods of grounding equipment

With circuit conductors. Noncurrent-carrying metal parts of fixed equipment, if required to be grounded, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

A conductor used for grounding fixed or movable equipment shall have capacity to conduct safely any fault current which may be imposed on it.

Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in paragraph (f)(8)(i) of this section. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

Bonding. If bonding conductors are used to assure electrical continuity, they shall have the capacity to conduct any fault current which may be imposed.

Made electrodes. If made electrodes are used, they shall be free from nonconductive coatings, such as paint or enamel; and, if practicable, they shall be embedded below permanent moisture level. A single electrode consisting of a rod, pipe or plate which has a resistance to ground greater than 25 ohms shall be augmented by one additional electrode installed no closer than 6 feet (1.83 m) to the first electrode.

Grounding of systems and circuits of 1000 volts and over (high voltage)

Grounding of systems supplying portable or mobile equipment. Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

- Portable and mobile high voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.
- Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.
- Ground-fault detection and relaying shall be provided to automatically de-energize any high voltage system component which has developed a ground fault. The continuity of

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the equipment grounding conductor shall be continuously monitored so as to de-energize automatically the high voltage feeder to the portable equipment upon loss of continuity of the equipment grounding conductor.

- The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet (6.1 m) from any other system or equipment grounding electrode, and there shall be no direct connection between the grounding electrodes, such as buried pipe, fence or like objects.

Grounding of equipment. All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet (2.44 m) above ground or grade level need not be grounded.

WIRING METHODS, COMPONENTS, AND EQUIPMENT FOR GENERAL USE

Wiring methods. The provisions of this paragraph do not apply to conductors which form an integral part of equipment such as motors, controllers, motor control centers and like equipment.

Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

Wiring in ducts. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type shall be installed in any duct used for vapor removal or in any shaft containing only such ducts.

Temporary wiring

Feeders shall originate in a distribution center. The conductors shall be run as multiconductor cord or cable assemblies or within raceways.

Branch circuits shall originate in a power outlet or panelboard. Conductors shall be run as multiconductor cord or cable assemblies or open conductors, or shall be run in raceways. All conductors shall be protected by over current devices at their ampacity. No branch-circuit conductors shall be laid on the floor. Each branch circuit that supplies receptacles or fixed

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equipment shall contain a separate equipment grounding conductor if the branch circuit is run as open conductors.

Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor, and all receptacles shall be electrically connected to the grounding conductor. Receptacles for uses other than temporary lighting shall not be installed on branch circuits which supply temporary lighting. Receptacles shall not be connected to the same ungrounded conductor of multiwire circuits which supply temporary lighting.

Disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

All lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension.

Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

A box shall be used wherever a change is made to a raceway system or a cable system which is metal clad or metal sheathed.

Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage.

Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage. NOTE: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

Guarding. For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

Cabinets, boxes, and fittings

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Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

Employee's are prohibited from work in such proximity to any part of an electric power circuit that the employee could contact the course of work, unless the employee is protected against electric shock by deenergizing the circuit and grounding it or by guarding it effectively by insulation or other means.

In work areas where the exact location of underground electric powerlines is unknown, employees using jack-hammers, bars, or other hand tools which may contact a line must be provided with insulated protective gloves.

Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a hazard to employees.

In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

PORTABLE EXTENSION CORDS

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Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered.

- Worn or frayed electric cords or cables shall not be used.
- Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

TAGGING AND LOCKOUT OF CIRCUITS

Tags shall be placed to identify plainly the equipment or circuits being worked on.

Tag controls that are to be deactivated during the course of work on energized or deenergized equipment or circuits. Lock out switches opened to deenergize circuits.

Deenergize and tag equipment or circuits rendered inoperative and attach tags at all points where such equipment or circuits can be energized.

ENVIRONMENTAL DETERIORATION OF EQUIPMENT

Unless identified for use in the operating environment, no conductors or equipment shall be located:

- In damp or wet locations;
- Where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment; or
- Where exposed to excessive temperatures.

Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials resistant to corrosion in the installation environment.

BATTERIES AND BATTERY CHARGING

Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.

Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.

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Racks and trays shall be substantial and shall be treated to make them resistant to the electrolyte.

Floors shall be of acid resistant construction unless protected from acid accumulations.

Face shields, aprons, and rubber gloves shall be provided for workers handling acids or batteries.

Facilities for quick drenching of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.

Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.

Battery charging installations shall be located in areas designated for that purpose.

Charging apparatus shall be protected from damage by trucks.

When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

5.8 SAFETY ABOVE GROUND

| | |
|---------------------------------------|------|
| Ladder Safety | 5-47 |
| Floor and Wall Openings | 5-49 |
| Elevated Platforms and Scaffolds..... | 5-50 |

LADDER SAFETY

A study of 150 construction accidents involving a ladder determined that serious injuries were caused by one or more of these contributing factors:

1. Unsafe physical placement of the ladder or unsafe surroundings, such as uneven ground or failure to secure the ladder at the top or bottom.
2. Unsafe condition of the ladder, such as slick or worn rungs, lack of rubber feet, or structural weariness of the ladder.
3. Unsafe act by the worker, such as using a step ladder as a straight ladder (leaned up against a wall); climbing or descending improperly; carrying objects while climbing or descending; standing on the top two steps without fall protection; and walking the ladder instead of descending to move it.

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All ladders must be maintained in good condition; joints between steps and side rails tight; all hardware, fittings, and non-slip safety feet securely attached; and movable parts operating freely without binding or undue play. All ladders must meet the state-OSHA requirements and should be thoroughly inspected before use.

Ladder rungs and steps must be free of grease and oil. Non-slip safety feet are recommended.

Ladders may not be placed in front of doors opening toward the ladder except when the door is blocked open, locked, or guarded.

Use the proper length ladder. Ladders may not be placed on boxes, barrels, or other unstable bases to obtain additional height. Never splice two ladders together.

Face the ladder and use both hands when ascending or descending.

Work while facing the ladder. One hand should always be used to hold on to the ladder. Ladders that are broken; missing steps, rungs, or cleats; or have broken side rails or other faulty equipment may not be used.

The top two steps or rungs of an stepladder must not be used to stand on. The rungs or steps should be uniformly spaced at 12 inches center to center.

When extension ladders are used, never climb to a point where you cannot maintain a good handhold. To gain access to elevated platforms, roofs, etc., the ladder or side rails should extend at least three feet above the elevated surface.

Always position a ladder properly so that the distance from the wall is 1/4 the length of the ladder. The base must be placed, lashed or otherwise secured so that slipping will not occur. If possible, tie or lash the top of the ladder in place.

Ladders may not be used as guys, braces, skids, gin poles, or for other than their intended purposes.

Ladders used on smooth surfaced floors should be equipped with safety feet.

A ladder must be adjusted or moved only from its base (not while standing on the ladder or from a position above the ladder). Never attempt to move or wag a ladder while standing on it.

Do not attempt to reach over. In addition to the hazard of falling, a worker can wrench a back or shoulder from the strain of reaching over.

Metal ladders must never be used when working with electrical circuits of any type, or in places where electrical contact could be made.

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Do not use a ladder as a platform or walk on a ladder while it is in a horizontal position. It is not designed for such loads.

Do not work on a ladder outside in a high wind.

Climb a stepladder using the steps. Never climb the bracing on the back.

Ladders should be inspected frequently during use. Look for cracks and splits on side rails, rungs and steps. All rung/step to side rail connections must be checked, as well as hardware connections, rivets (for shear), and all other components, such as ropes, cables and pulleys.

Metal ladders must never be used near overhead power lines or near electrical transformers. It is not always necessary to come in contact with the line to produce an arc.

When a ladder has structural damage or is otherwise defective, it must be taken out of service and replaced or repaired. Do not attempt to make structural repairs to a ladder in the field.

Wooden ladders should not be stored where they are exposed to the elements, water or moisture. Ladders should be secured by lock and chain when not in use and at the end of each shift.

Only use your own ladder. Never borrow another trade's ladder. Likewise, never allow another trade to use your ladder.

FLOOR AND WALL OPENINGS

Floor openings and pits must be covered or otherwise protected by a guardrail or equivalent on all sides (except at the entrance to stairways or ladders).

Grates or other covers over floor drains, manholes, and similar openings must be kept in place. The grate spacing must be such that foot and rolling equipment traffic will not be affected.

Material, such as lengths of pipe, may not be stacked on upper floors within 6 feet of any edge, nor in a manner which there is the possibility of the material rolling or being knocked off the edge.

Floor penetrations over 5 inches in diameter must be covered. When work on a floor requires the covers be removed, then post signs near the area you are working in, near stairways and elevators or manlifts.

Never leave an opening unprotected. Replace guardrails and covers or report the condition to the General Contractor. Do not allow any employee to work near an unprotected opening.

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In places where no other form of protection from the hazard of falling is available, an approved safety belt or safety harness and lifeline should be used.

Covers for floor and wall openings must be compatible with the fire rating of the structure.

ELEVATED PLATFORMS AND SCAFFOLDS

The load capacity of elevated surfaces must be not be exceeded. The load capacity of the elevated surface must be posted as appropriate.

Stairways must have at least a 6 foot six inch overhead clearance. Stairways must be at least 22 inches wide.

Guardrails, midrails, standard 4 inch toeboards and other protective devices are required for elevated surfaces (platforms) 30 inches or more above the floor or ground. Guardrails are to be 42 inches above the platform floor.

Means of access and egress provided to elevated storage and work surfaces must not be removed. Always ascend or descend using the ladder and handrails.

Material on elevated surfaces must be piled, stacked, or racked in a manner to prevent it from tipping, falling, collapsing, rolling, or spreading.

Always inspect scaffolds and floats before getting on them, Make sure all lines are tied to a secure support.

All scaffolds are to be equipped with a top rail 42 inches high, an intermediate guard rail and OSHA-approved planking. Planks shall not extend more than 12 inches past support edges.

Any damaged or defective scaffolds or elevated platforms must be repaired or not used. Rolling scaffolds shall have wheels or casters with an appropriate locking device and kept locked when employees are climbing or working on scaffold.

See FIGURE – 5-1

SAFETY ABOVE GROUND

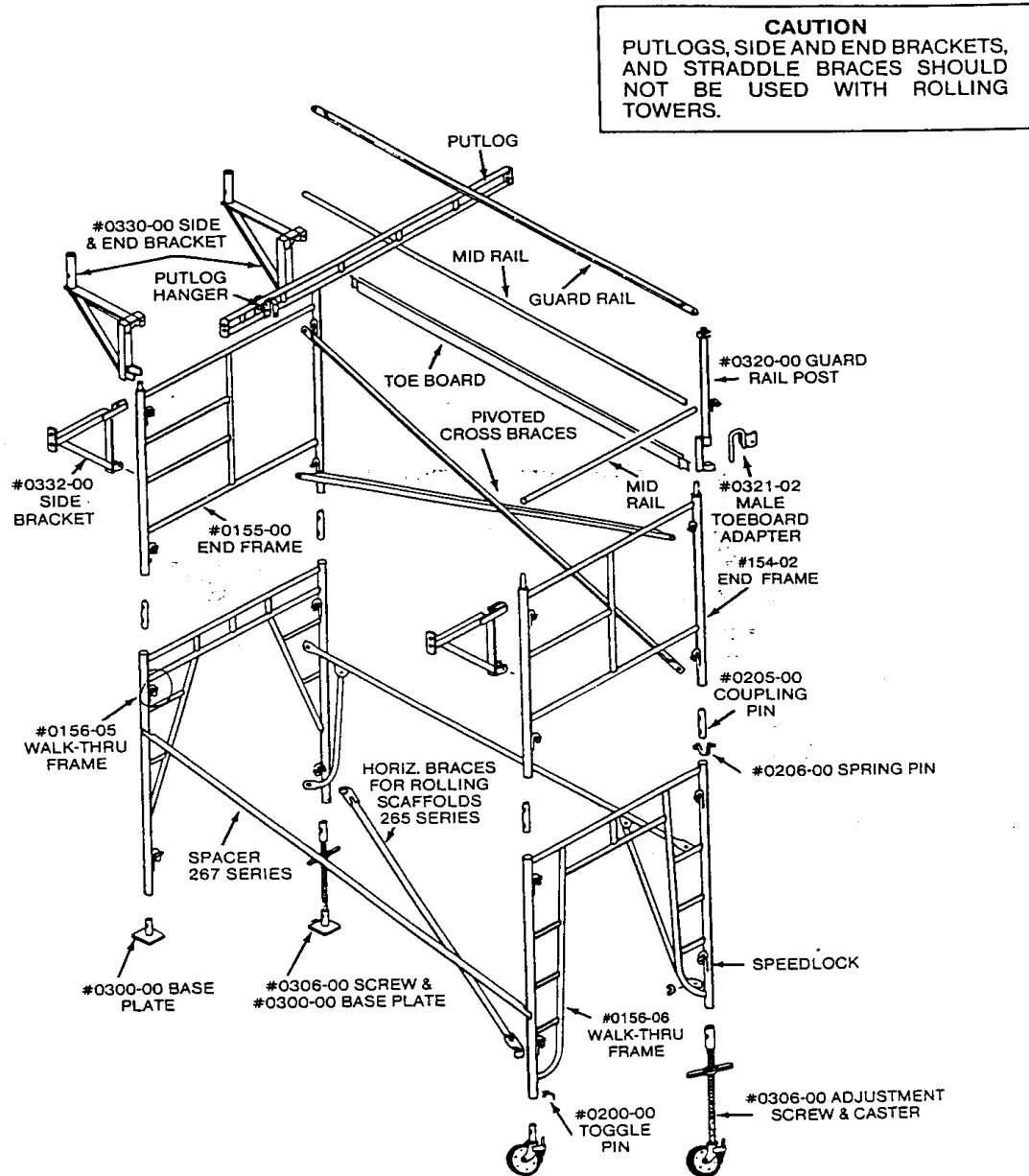


FIGURE – 5-1 Scaffold Illustration

5.9 CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS

| | |
|---------------------------|------|
| Cranes and Derricks | 5-52 |
| Hoists and Lifts | 5-54 |

CRANES AND DERRICKS

The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions.

The manufacturer's specifications and limitations are to be adhered to for the operation of any and all cranes and derricks. Where manufacturer's specifications are not available, a qualified engineer competent in this field must determine the limitations assigned to the equipment. Such determinations will be appropriately documented and recorded. Attachments used with cranes may not exceed the capacity, rating, or scope recommended by the manufacturer.

The load chart (rated load capacities, and recommended operating speeds is posted where clearly visible to the operator. Instructions or warnings will be visible to the operator while he is at his control station. The rated capacity will be marked on each crane. Cranes will include boomstops if the boom could fall over backwards.

Standard hand signals to crane and derrick operators the type of crane in use. An illustration of the signals shall be posted at the job site. An audible warning device will be mounted on each crane.

Cranes and derricks are inspected by a competent person prior to each use, and during use, to make sure the equipment is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. Operating controls are clearly identified.

A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor. The employer shall maintain a record of the dates and results of inspections for each hoisting machine and piece of equipment. A certificate of inspection will be kept with the crane showing required inspections and testing have been performed

Wire rope will be periodically inspected for randomly distributed broken wires, excessive wear, kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure, and evidence of any heat damage. Damaged wire rope will be replaced.

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Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard

Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, shall be barricaded in such a manner as to prevent an employee from being struck or crushed by the crane. All employees shall be kept clear of loads about to be lifted and of suspended loads.

Guard or insulate exhaust pipes in areas where contact by employees is possible in the performance of normal duties.

All windows in cabs shall be of safety glass, or equivalent, that introduces no visible distortion that will interfere with the safe operation of the machine.

Where necessary for rigging or service requirements, a ladder, or steps, shall be provided to give access to a cab roof.

Guardrails, handholds, and steps shall be provided on cranes for easy access to the car and cab. Crane-mounted platforms and walkways shall have anti-skid surfaces.

Fuel tank filler pipe shall be located in such a position, or protected in such manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.

Operator stations or cabs will be provided with a readily accessible fire extinguisher of 5BC rating.

Generally, electrical distribution and transmission lines should be deenergized and visibly grounded at point of work. Where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated with the following clearances:

| Line voltage | Clearance (any part of crane) |
|---------------|--|
| 50 kV or less | 10 feet |
| Over 50 kV | Twice length of line insulator but never less than 10 feet |

A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

Consider any overhead wire shall be considered to be an energized line unless and until the person owning the line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

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No modifications or additions which affect the capacity or safe operation of the equipment are permitted without the manufacturer's written approval, or determination by an engineer competent in this field. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

HOISTS AND LIFTS

Only those employees who have been trained in the proper use of hoists and lifts are allowed to operate them.

Stops provided at the safe limits of travel must be kept in place. Stops are required both for hook travel and trolley travel. Hoists must automatically stop and hold loads if the power is lost.

Controls must be plainly marked to indicate the direction of travel or motion. The rated load of each hoist or lift must be legibly marked, visible to the operator, and never exceeded.

All hoist chains, cables, or ropes must be of sufficient length to handle the full range of movement for the application while still maintaining two full wraps on the drum at all times. Guards are installed to assure hoist ropes remain in the sheave grooves.

The hoist chain, cable, or rope must never be wrapped around the load as a substitute for a sling. Slings must not be linked or twisted. The use of kinked or twisted chains or rope slings is prohibited.

Carrying loads over people with a hoist must be avoided. Nip points between hoist ropes and sheaves within seven feet of the ground or floor are guarded.

Do not move winch trucks unless loads suspended from the winch lines are secured to prevent swinging.

No riders are allowed on the ball or hook of any crane or derrick, or on equipment, rigging or loads being moved by crane or derrick.

Cranes, derricks and winch trucks must not be operated nearer than allowed by Cal-OSHA regulations or the National Electrical Code. Lines which could come into contact with any equipment must first be de-energized or otherwise made safe before any work is done.

Use a tag line on loads that are liable to shift or sway while being hoisted or lowered. Keep all persons out from under loads and clear from moving loads.

5.10 MOTOR VEHICLES AND MECHANIZED EQUIPMENT

| | |
|---|------|
| Motor Vehicles | 5-55 |
| Air Compressors | 5-56 |
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| Lift Truck (Forklift) Safety | 5-58 |
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MOTOR VEHICLES

Motor vehicles as covered by this part are those vehicles that operate within an off-highway jobsite, not open to public traffic. All motor vehicles shall have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components, and shall be maintained in operable condition.

Whenever visibility conditions warrant additional light, vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition.

All vehicles, shall have brake lights in operable condition regardless of ambient light conditions.

All vehicles shall be equipped with an adequate audible warning device at the operator's station and in an operable condition.

No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:

- The vehicle has a reverse signal alarm audible above the surrounding noise level, or;
- The vehicle is backed up only when an observer signals that it is safe to do so.

All vehicles with cabs shall be equipped with windshields and powered wipers. Cracked and broken glass shall be replaced. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields shall be equipped with operable defogging or defrosting devices.

All haulage vehicles, whose payload is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

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Tools and material shall be secured to prevent movement when transported in the same compartment with employees.

Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried.

Seat belts and anchorages meeting the requirements of DOT Standards shall be installed in all motor vehicles.

Trucks with dump bodies shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.

Operating levers controlling hoisting or dumping devices on haulage bodies shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.

Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.

All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc., where such equipment is necessary.

AIR COMPRESSORS

Compressors must be equipped with pressure relief valves and pressure gauges. Compressor air intakes must be installed and equipped so as to ensure that only clean uncontaminated air enters the compressor. Air filters must be installed on the compressor intake.

Safety devices on compressed air systems must be checked frequently; compressors must be operated and lubricated in accordance with the manufacturer's recommendations.

Before any repair work is done on the compressor pressure system, the pressure must be bled off and the system locked-out.

Signs posted to warn of the automatic starting feature of compressors must not be removed or blocked from view.

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The belt drive system of compressors must be totally enclosed to provide protection for the front, back, top, and sides.

Safety chains or other suitable locking devices should be used at couplings of high pressure hose lines where a connection failure would create a hazard.

It is strictly prohibited to direct compressed air towards a person.

The inlet of air receivers and piping systems must be kept free of accumulated oil and carbon materials.

JACKHAMMERS

The jackhammer is a heavy, unwieldy, hand-held tool which can quickly fatigue the operator. Back, shoulder, wrist and elbow pain are common complaints.

On uneven, rough or sloping surfaces, the operator must maintain secure control of the jackhammer. The operator must keep his feet clear and never guide the drill with the feet.

Hole collaring should be performed at low speed to prevent the drill from jumping. Vibration can cause bolts to loosen, causing both a hazard to the operator and reducing the effectiveness of the tool. Bolts should be checked and tightened regularly. Should a drill break during operation, there is an immediate that the hammer can fall on or strike the operator's feet or legs, or cause him to lose balance and fall. To offset the potential of drill breakage, several maintenance items should be practiced:

1. Keep drills sharp. Dull drills cause strain on the steel, resulting in premature breaking, and making the operator work harder.
2. Keep chuck bushing and hammer in good condition.
3. Replace worn parts before they become excessively worn.
4. Release the trigger to cut off the air supply when prying or applying undue leverage to the tool.

For the most efficient and safe operation, jackhammers should be equipped with instant trigger control (and automatic release). There should be a locking mechanism to retain the drill bit.

TAMPERS

Tampers pose a hazard to both the feet and the head. The operator must keep his feet as far back as possible. Simultaneously, the head must be held to one side to avoid contact when the tamper is striking upward.

The tamper operator must also guard against the danger of back and arm strain. Toe guards must

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be used during tamping operations.

LIFT TRUCK (FORKLIFT) SAFETY

Only those employees who have been trained in the proper use of forklifts are authorized to operate them. No person outside the Company is allowed to operate a Company forklift. The forklift is to have adequate overhead protection.

Forklifts must be inspected daily and any problems corrected before operation. Refueling or recharging must occur in designated areas only.

Forklifts must never be loaded beyond their rated capacity. Loads should be kept low and balanced with the mast tilted slightly back; wide loads must be centered. Loads should not be raised or lowered while the forklift is moving and a load must not be so tall that it can cause the forklift to tip over. If traveling on inclines, the load must be on the uphill side. If a load blocks the view of the operator, driving should be in reverse. When unloading, the operator should back out slowly, checking for traffic or obstacles. When traveling unloaded, the forks should be lowered.

Passengers must never be lifted or carried on the forks unless the forklift has an approved man-lift device. No person is to stand on the forks of a forklift, unless secured by an approved safety belt. No riders are allowed on any part of a moving forklift. No one should be allowed to walk under or work under raised forks, whether loaded or unloaded.

When not in use, forklifts should be parked on flat surfaces with the forks lowered and flattened. The parking brake must be set. Block the wheels when parking on a slope.

Seat belts must be worn at all times while operating a forklift. Forklifts are to be equipped with a working horn and an automatic back-up alarm.

Dock plates or bridge plates must always be used when driving the forklift into a trailer from a loading dock.

When negotiating a sharp turn, keep close to the inside corner and start your turn when the front wheels meet the corner. When turning into a narrow aisle, approach from as far away as possible and begin your turn early - before reaching the middle of the aisle.

The load should be distributed equally and squarely on both forks. The load should touch the carriage. Tilt the mast backwards slightly before lifting the load. Do not carry the load any higher than absolutely necessary.

To keep the load balanced, operate forward on upgrades and backwards on downgrades.

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To deposit a load, tilt the mast forward slightly when directly over the unloading point. Set the load on the ground, then carefully back away to disengage forks.

Pay special attention to load swing when carrying pipe or other long items. Set the parking brake whenever dismounting from the lift truck.

MACHINERY OPERATIONS AND GUARDING

Only properly trained and authorized employees are permitted to operate Company machines and equipment.

Machinery will be kept clean and properly maintained. Shutdown machinery before cleaning, oiling or adjusting.

Before using any electrically-powered machinery, make sure it is properly grounded.

Before operating any machine, all inspect the equipment to assure that guards and safety devices must be in place and operable.

LOCKOUT/ BLOCKOUT

Machinery or equipment capable of movement must be de-energized or disengaged and blocked or locked-out during cleaning, servicing, adjusting, or setting up operations. The main power circuit, not just a control circuit, must be locked-out. All stored energy (mechanical, hydraulic, air, etc.) must be released or blocked. The equipment control handles, valves, etc. must provide an off-position locking capability.

Employees who are working on locked-out equipment must be identified by their locks or accompanying tags and must keep control of their keys while their safety locks are in use. Only the employee exposed to the hazard is permitted to place or remove a safety lock during a lockout/blockout procedure.

The employee exposed to the hazard should check the safety of the lock-out by attempting a start up after making sure no one is exposed.

When machine operations, configuration, or size requires the operator to leave his/her control station to install tools or perform other operations, and that part of the machine could move if accidentally activated, such element must be separately locked or blocked out.

In the event that equipment or lines cannot be shut down, locked-out, and tagged, a safe procedure directed by management for that particular situation must be followed.

The control circuit stop button should be pushed prior to re-energizing the main power switch.

PNEUMATIC POWER TOOLS

Secure pneumatic power tools to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected. Install and maintain safety clips or retainers on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled. Do not use hoses for hoisting or lowering tools and do not exceed the manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings.

A safety device that prevents the tool from accidentally firing fasteners is required on pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed. The safety devices should prevent the tool from ejecting fasteners when the muzzle of the tool is not in contact with the work surface.

Highly compressed air may not be used for cleaning purposes. If compressed air is used for cleaning off clothing, the pressure must be reduced to less than 10 psi. When using compressed air for blast cleaning, employees must wear protective chip guarding and personal protective equipment.

When compressed air is used for abrasive blast cleaning, the operating valve must be of a type that is held open manually. A support must be provided on which the nozzle may be mounted when it is not in use. When compressed air is used to inflate auto tires, a clip-on chuck and an inline regulator preset to 40 psi is required.

Airless spray guns that atomize paints and fluids at high pressures (1,000 psi or more) must be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. A diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator is also acceptable.

FUEL POWERED TOOLS

Stop and shut off the ignition of fuel powered tools while they are being refueled, serviced, or maintained. The use of fuel powered tools in enclosed spaces where high concentrations of toxic gases can accumulate is prohibited.

HYDRAULIC POWER TOOLS

Use fire-resistant fluids in hydraulic powered tools. Don't exceed the manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings.

POWDER-ACTUATED TOOLS

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Only powder-actuated tools approved by the Division of Occupational Safety and Health may be used on the Company's projects. Powder-actuated tools are stored in their own locked container when not in use.

Powder-actuated tools may be operated only by employees who have been trained in the operation of the particular tool. Inspect or test the tool as recommended by the manufacturer each day before loading to see that safety devices are in proper working condition.

Do not load powder-actuated tools until just prior to use. Put the tool away immediately after using it and do not leave it unattended. Post a sign stating "POWDER-ACTUATED TOOL IN USE" when the tool is being used.

Don't try to drive fasteners into very hard or brittle materials such as cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.

Don't drive fasteners into soft materials unless such materials are backed by something that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

Don't drive fasteners into a spalled area caused by an unsatisfactory fastening.

Tools shall not be used in an explosive or flammable atmosphere.

All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

Powder-actuated tools used by employees shall meet all other applicable requirements of American National Standards Institute, A10.3-1970, Safety Requirements for Explosive-Actuated Fastening Tools.

AIR RECEIVERS

Air receivers are constructed in accordance with the applicable ASME pressure vessel codes.

Install air receivers so that all drains, handholes, and manholes in them are easily accessible. Under no circumstances may an air receiver be buried or located in an inaccessible place. Install a drain pipe and valve at the lowest point of every air receiver to provide for the removal of accumulated oil and water. Adequate automatic traps may be installed in addition to drain valves. Open the drain valve on the air receiver periodically to drain it and prevent the accumulation of excessive amounts of liquid in the receiver.

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Every air receiver shall be equipped with an indicating pressure gage (so located as to be readily visible) and with one or more spring-loaded safety valves. The total relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent.

No valve of any type shall be placed between the air receiver and its safety valve or valves. Make sure there are no obstructions to safety valves, indicating devices and controlling devices and periodically test safety valves to determine whether they are in good operating condition.

JACKS-LEVER AND RATCHET, SCREW, AND HYDRAULIC

Do not attempt to exceed the manufacturer's rated capacity, which is marked on the jack. Make sure the jack has a positive stop to prevent overtravel.

If necessary, provide a firm foundation by blocking or cribbing the base of the jack. Again, if necessary, where there is a possibility of slippage of the metal cap of the jack, place a wood block between the cap and the load.

After the load has been raised, it shall be cribbed, blocked, or otherwise secured at once.

Inspect each jack thoroughly at times not less frequent than the following:

- With constant or intermittent use at one locality, once every 6 months,
- With jacks sent out for special work, when sent out and when returned,
- Immediately after a jack has been subjected to abnormal load or shock

Tag and do not use jacks that are out of order

5.11 TRENCHING AND SHORING

Trenching and Shoring..... 5-63

TRENCHING AND SHORING

Some of the most serious accident common to construction are excavation and trench cave-ins. Almost all of these accidents result from a failure to adequately shore or slope the trench. This section applies to any excavation, as well as trenches.

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Each company doing trenching work shall have an annual trenching and shoring permit from the state-OSHA. The trenching subcontractor's Superintendent is responsible for advising state-OSHA of any trenching or excavations 5 feet deep or more.

A competent person is required to inspect all trenches daily for evidence that could result in a possible cave-in. Do not allow workers in or near a trench until a competent person has determined that no hazard exists.

A competent person is defined as one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, and has authorization to take prompt corrective action. It is expected that Foremen and lead Journeymen would be classified as competent persons, particularly in being able to identify various soil types and strengths visually and knowledge of approved shoring, sloping and benching.

The competent person must also inspect trenches after rainstorms, thaws or other events which may effect the stability of the soil, before workers are allowed to enter.

Where the competent person finds evidence of a situation that could result in a possible cave-ins, indications of failure of a protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to insure their safety.

Trenches 5 feet deep or more must either be shored, sloped or benched. In loose or unstable soil, it may be necessary to shore, slope or bench in less than 5 feet.

Excavated material, or spoil, should be dumped far enough from the edge of a trench so that it does not tend to fall back. Do not drive stakes or contain the soil by any method which would disturb the trench.

Workers must have a safe and convenient way to enter and leave any trench of 4 feet or more, within 25 feet of any work area in the excavation.

Use barricades, railings, fencing or other approved methods to keep bystanders from falling into a trench. If a trench is more than 7-1/2 feet deep, any protection provided must have standard guardrails and toeboards.

TRENCHING AND SHORING

**MINIMUM SHORING REQUIREMENT IN HARD COMPACT
SOIL—HYDRAULIC**

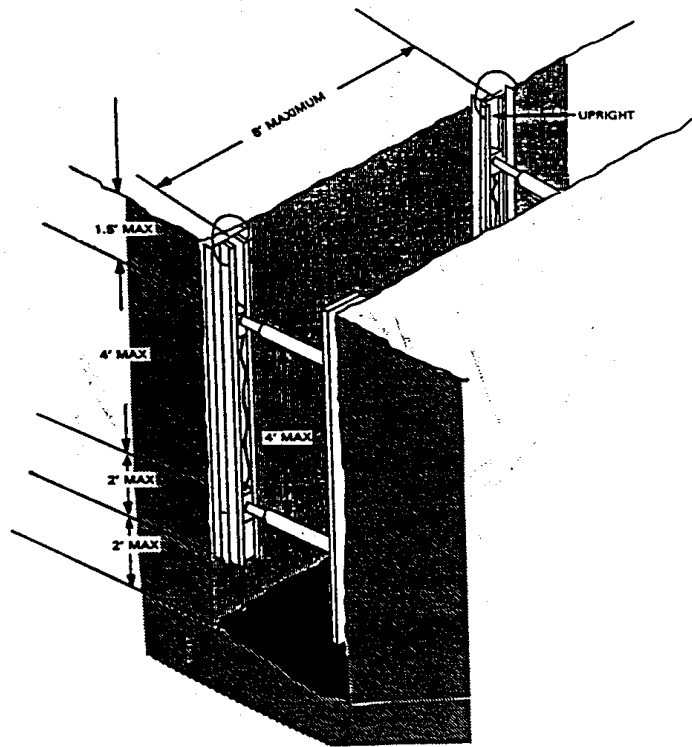
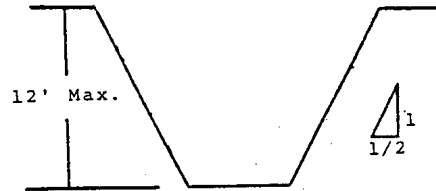


FIGURE - 50A

FIGURE 5-2 Minimum Showing Requirement in Hard Compact Soil – Hydraulic

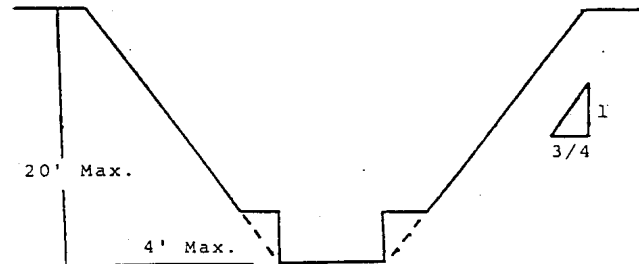
TRENCHING AND SHORING

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2:1.



Simple Slope - Short Term

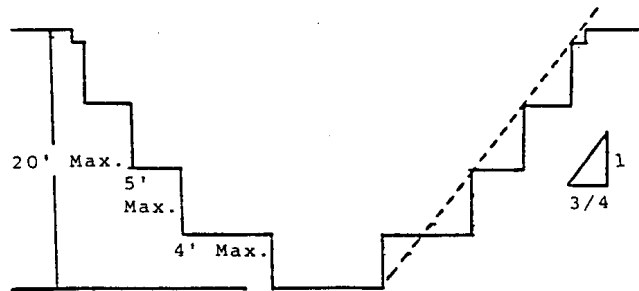
2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:



Simple Bench

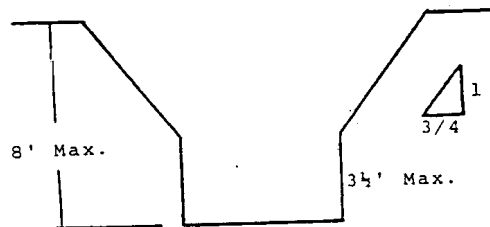
FIGURE - 5-3a Simple Slope (top)
FIGURE - 5-3b Simple Bench (bottom)

TRENCHING AND SHORING



Multiple Bench

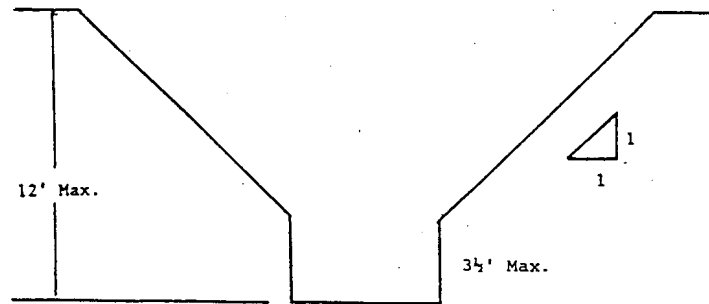
3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.



Unsupported Vertically Sided Lower Portion - Maximum 8 Feet in Depth

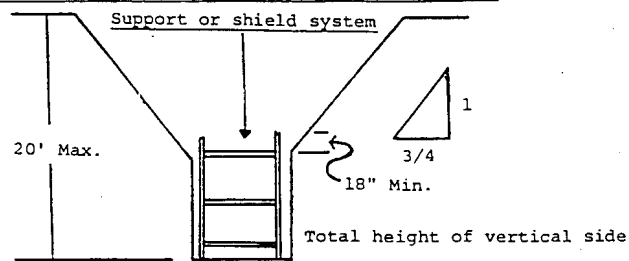
All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3 1/2 feet.

TRENCHING AND SHORING



Unsupported Vertically Sided Lower Portion - Maximum 12 Feet in Depth

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



Supported or Shielded Vertically Sided Lower Portion

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under 1541.1(b).

FIGURE – 5-5a Unsupported Vertically Sided – 12 feet
FIGURE 5-5b Supported or Shielded Vertically Sided

TRENCHING AND SHORING

MINIMUM SHORING REQUIREMENT IN HARD COMPACT SOIL

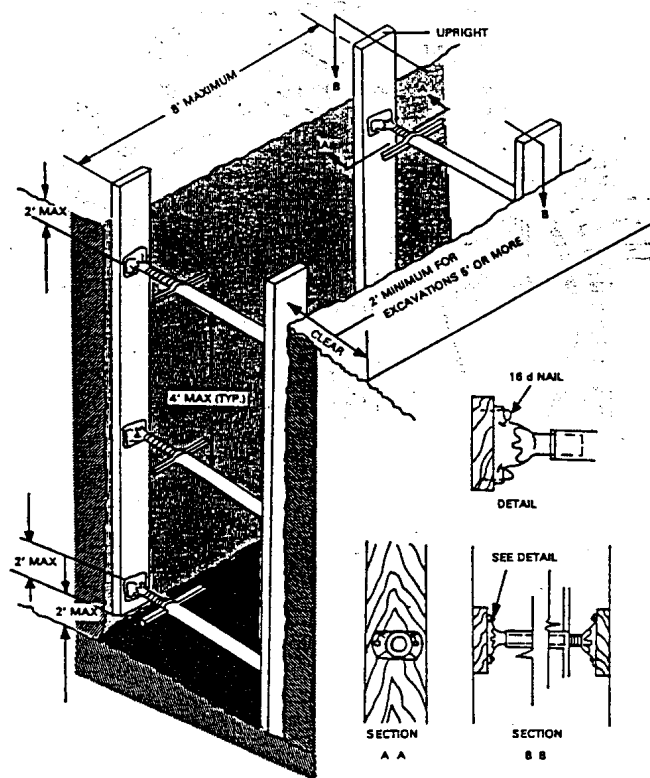


FIGURE – 5-6 Minimum Showing Requirement – Hard Compact Soil

TRENCHING AND SHORING

TABLE B-1
MAXIMUM ALLOWABLE SLOPES

| SOIL OR ROCK TYPE | MAXIMUM ALLOWABLE SLOPES (H:V) FOR EXCAVATIONS LESS THAN 20 FEET DEEP [3] |
|---|---|
| STABLE ROCK TYPE A [2] TYPE B TYPE C | VERTICAL (90°) 3/4:1 (53°) 1:1 (45°) 1 1/2:1 (34°) |

NOTES:

1. Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
2. A short-term maximum allowable slope of 1/2H:1V (63 degrees) is allowed in excavations in Type A soil that are 12 feet or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet in depth shall be 3/4H:1V (53 degrees).
3. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

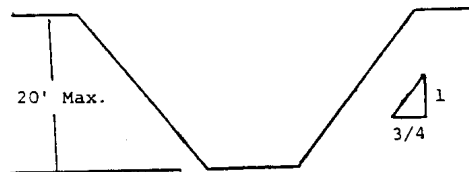
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

B - 1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



Simple Slope - General

FIGURE - 57 Simple slope - Type A Soil

5.12 CONCRETE AND MASONRY CONSTRUCTION

| | |
|---------------|----|
| General | 71 |
|---------------|----|

GENERAL

No construction loads shall be placed on a concrete structure or portion of a concrete structure unless a person who is qualified in structural design, determines that the structure or portion of the structure is capable of supporting the loads.

Protruding reinforcing steel, onto and into which employees could fall, must be guarded to eliminate the hazard of impalement. Plastic caps are not sufficient protection.

Post-tensioning operations.

- No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations.
- Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.
- Riding concrete buckets. No employee shall be permitted to ride concrete buckets.

Working under loads.

- No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.
- To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

5.13 STEEL ERECTION

| | |
|--|------|
| Flooring Requirements | 5-72 |
| Structural Steel Assembly | 5-73 |
| Bolting, Fitting-up, and Plumbing-up | 5-73 |

FLOORING REQUIREMENTS

The permanent floors are installed as the erection of structural members progresses, and there may be not more than eight stories between the erection floor and the uppermost permanent floor, except where the structural integrity is maintained as a result of the design.

At no time are there be more than four floors or 48 feet of unfinished bolting or welding above the foundation or uppermost permanently secured floor.

Temporary flooring-skeleton steel construction in tiered buildings.

The derrick or erection floor is to be solidly planked or decked over its entire surface except for access openings. Planking or decking of equivalent strength, will be of proper thickness to carry the working load. Planking of not less than 2 inches thick full size undressed is laid tight, and secured to prevent movement.

On buildings or structures not adaptable to temporary floors, and where scaffolds are not used, safety nets are installed and maintained whenever the potential fall distance exceeds two stories or 25 feet. The nets have sufficient clearance to prevent contacts with the surface of structures below.

A safety railing of 1/2-inch wire rope or equal, approximately 42 inches high, provides protection around the periphery of all temporary-planked or temporary metal-decked floors of tier buildings and other multifloored structures during structural steel assembly.

Where skeleton steel erection is being done, a tightly planked and substantial floor is maintained within two stories or 30 feet, whichever is less, below and directly under that portion of each tier of beams on which any work is being performed. Gathering and stacking temporary floor planks on a lower floor, in preparation for transferring such planks for use on an upper floor is permitted.

When gathering and stacking temporary floor planks, the planks are to be removed successively, working toward the last panel of the temporary floor so that the work is always done from the planked floor. Employees assigned to this work must be protected by safety belts with safety lines attached to a catenary line or other substantial anchorage.

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Flooring - other construction

In the erection of a building having double wood floor construction, the rough flooring shall be completed as the building progresses, including the tier below the one on which floor joists are being installed.

For single wood floor or other flooring systems, the floor immediately below the story where the floor joists are being installed shall be kept planked or decked over.

STRUCTURAL STEEL ASSEMBLY

During the final placing of solid web structural members, the load shall not be released from the hoisting until the members are secured with not less than two bolts, or the equivalent, at each connection and drawn up wrench tight.

Open web steel joists shall not be placed on any structural steel framework unless such framework is safely bolted or welded.

In steel framing, where bar joists are utilized, and columns are not framed in at least two directions with structural steel members, a bar joist shall be field-bolted at columns to provide lateral stability during construction.

Where longspan joists or trusses, 40 feet or longer, are used, a center row of bolted bridging shall be installed to provide lateral stability during construction prior to slacking of hoisting line.

No load shall be placed on open web steel joists until these security requirements are met.

Tag lines shall be used for controlling loads.

BOLTING, FITTING-UP, AND PLUMBING-UP.

General requirements.

Containers shall be provided for storing or carrying, bolts, and drift pins, and secured against accidental displacement when aloft.

Pneumatic hand tools shall be disconnected from the power source, and pressure in hose lines shall be released, before any adjustments or repairs are made.

Air line hose sections shall be tied together except when quick disconnect couplers are used to join sections.

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Bolting.

When bolts or drift pins are being knocked out, means shall be provided to keep them from falling.

Impact wrenches shall be provided with a locking device for retaining the socket.

Plumbing-up.

Connections of the equipment used in plumbing-up shall be properly secured.

The turnbuckles shall be secured to prevent unwinding while under stress.

Plumbing-up guys related equipment shall be placed so that employees can get at the connection points.

Plumbing-up guys shall be removed only under the supervision of a competent person.

Wood planking shall be of proper thickness to carry the working load, but shall be not less than 2 inches thick full size undressed, exterior grade plywood at least 3/4-inch thick, or equivalent material.

Metal decking of sufficient strength shall be laid tight and secured to prevent movement.

Planks shall overlap the bearing on each end by a minimum of 12 inches.

Wire mesh, exterior plywood, or equivalent, shall be used around columns where planks do not fit tightly.

Provisions shall be made to secure temporary flooring against displacement.

All unused openings in floors, temporary or permanent, shall be completely planked over or guarded in accordance with Subpart M of this part.

Employees shall be provided with safety belts when they are working on float scaffolds.

5.14 DEMOLITION

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GENERAL

Prior to permitting employees to start demolition operations, an engineering survey of the structure shall be made by a competent person to determine the condition of the framing, floors, and walls, and possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in writing evidence that such a survey has been performed.

During demolition, continuing inspections by a competent person shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material. No employee shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

When employees are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company which is involved shall be notified in advance.

If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

The survey will be determine if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging will eliminate the hazard before demolition is started.

Where a hazard exists from fragmentation of glass, such hazards shall be removed.

Wall openings where a hazard exists of employees falling through are protected to a height of approximately 42 inches.

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When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

All floor openings, not used as material drops, are covered over with material substantial enough to support the weight of any load which may be imposed. Such material is properly secured to prevent its accidental movement.

Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction begins at the top of the structure and proceed downward. Each story of exterior wall and floor construction is removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

Employee entrances to multistory structures being demolished are completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of 8 feet. All such canopies are at least 2 feet wider than the building entrances or openings (1 foot wider on each side), and are capable of sustaining a load of 150 pounds per square foot.

EXITING OR EGRESS

Exits are marked with an exit sign and illuminated by a reliable light source. Directions to exits that are not immediately apparent are marked with visible signs. Doors and passageways that are not exits but could be mistaken for exits are marked "NOT AN EXIT."

Exit signs have the word "EXIT" in lettering at least five inches high with the stroke of the lettering at least 1/2 inch wide.

Exit doors are side-hinged and kept free of obstructions.

At least two means of egress are provided from elevated platforms, pits or rooms where the absence of a second exit would increase the risk of injury from hot, poisonous, corrosive, suffocating, flammable, or explosive substances.

There are sufficient exits to permit prompt escape in case of emergency, from each floor and from the building itself. If ramps are part of the exiting the ramp slope is limited to 1 foot vertical for 12 feet horizontal.

EXIT DOORS

Frameless glass doors used as exit doors are fully tempered and meet the safety requirements for

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human impact.

Doors required to serve as exits are designed and constructed, or specially marked, so that the way of exit travel is obvious. The way of travel is as direct as is practical.

Windows that might be mistaken for exit doors are made inaccessible by barriers or railings.

Exit doors are operable in the direction of travel without the use of a key or any special knowledge or effort when work is in progress. Panic bars open the exit door with less than 15 pounds of force in the exit direction.

Revolving, sliding, and overhead doors are prohibited as exit doors.

STAIRS, PASSAGEWAYS, AND LADDERS.

Only stairways, passageways, and ladders, designated as means of access to the structure of a building are used. Other access ways are entirely closed at all times.

Stairs, passageways, ladders and incidental equipment are periodically inspected and maintained in a clean safe condition. Stairs angle no more than 50 degrees and no less than 30 degrees. Step risers are uniform from top to bottom with no riser spacing greater than 7.5 inches. Stair treads are slip resistant.

Stairway landings are at least as long as they are wide, and are not more than 12 feet apart vertically. Stairways that exit into an area where vehicles may be operated have barriers and warnings to prevent employees from stepping into the path of traffic.

Stairway handrails are 30 to 34 inches above the leading edge of stair treads, and stairway handrails are 1.5 inches from the wall they are mounted on. Handrails will withstand a load of 200 pounds applied from any direction.

In a multistory building, stairwells in use are properly illuminated by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed. Access to the floor where the work is in progress is through a properly lighted, protected, and separate passageway.

CHUTES

No material is dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

All materials chutes, or sections thereof, at an angle of more than 45 deg. from the horizontal, are entirely enclosed, except for openings equipped with closures at or about floor level for the

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insertion of materials. The openings are 48 inches in height or less measured along the wall of the chute. At all stories below the top floor, such openings are closed when not in use.

When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.

Any chute opening into which workmen dump debris is protected by a substantial guardrail approximately 42 inches above the floor or other surface on which the men stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes are solidly covered over.

Where the material is dumped from mechanical equipment or wheelbarrows, securely attached toeboards or bumpers, not less than 4 inches thick and 6 inches high, are provided at each chute opening.

Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

REMOVAL OF MATERIALS THROUGH FLOOR OPENINGS

Openings cut in a floor for the disposal of materials are no larger in size than 25 percent of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place. Floors weakened or otherwise made unsafe by demolition operations shall be shored to carry safely the intended imposed load from demolition operations.

REMOVAL OF WALLS, MASONRY SECTIONS, AND CHIMNEYS

Masonry walls, or other sections of masonry, are not permitted to accumulate on the floors of the building so as to exceed the safe carrying capacities of the floors.

Wall sections, which are more than one story in height, are not permitted to stand alone without lateral bracing, unless such walls were originally designed and constructed to stand without such lateral support, and are in a condition safe enough to be self-supporting. All walls are left in a stable condition at the end of each shift.

Employees are prohibited from working on the top of a wall when weather conditions constitute a hazard.

No structural or load-supporting members on any floor shall be cut or removed until all stories above such a floor have been demolished and removed. This does not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment, provided that the load bearing capacity of the structure is maintained.

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Floor openings within 10 feet of any wall being demolished shall be planked solid, except when employees are kept out of the area below.

In buildings of "skeleton-steel" construction, the steel framing may be left in place during the demolition of masonry. Where this is done, all steel beams, girders, and similar structural supports must be cleared of all loose material as the masonry demolition progresses downward.

Walkways or ladders are provided to enable employees to safely reach or leave any scaffold or wall.

Walls, which serve as retaining walls to support earth or adjoining structures, are not demolished until the earth has been properly braced or adjoining structures have been properly underpinned.

Walls, which are to serve as retaining walls against which debris will be piled, must be capable of safely supporting the imposed load.

REMOVAL OF WALLS, FLOORS, AND MATERIAL WITH EQUIPMENT

The use of mechanical equipment is prohibited unless floors or surfaces are of sufficient strength to support the imposed load.

Floor openings have curbs or stop-logs to prevent equipment from running over the edge.

REMOVAL OF STEEL CONSTRUCTION

When floor arches have been removed, planking shall be provided for the workers engaged in razing the steel framing.

Steel construction is dismantled column length by column length, and tier by tier (columns may be in two-story lengths).

Structural members being dismembered may not be overstressed.

MECHANICAL DEMOLITION

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Workers are prohibited from any area that can be adversely affected by demolition operations when balling or clamming is being performed. Only those workers necessary for the performance of the operations are permitted in this area.

The weight of the demolition ball may not exceed 50 percent of the crane's rated load, based on the length of the boom and the maximum angle of operation. Further it may not exceed 25 percent of the nominal breaking strength of the line by which it is suspended. Whichever criteria results in a lesser value sets the limit on the weight of the ball.

The crane boom and loadline are as short as possible. The ball is attached to the loadline with a swivel-type connection to prevent twisting of the loadline, and is attached by positive means in such manner that the weight cannot become accidentally disconnected.

When pulling over walls or portions of walls, all steel members affected have been previously cut free.

Roof cornices or other such ornamental stonework is to be removed prior to pulling walls over.

5.16 CONFINED SPACES

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GENERAL

The purpose of this program is to protect employees and subcontractors who must enter into, work in and exit from confined spaces or enclosures from the risk of exposure to serious hazards such as entrapment, engulfment and hazardous atmospheric condition. This permit-required confined space program is available for inspection by Company employees or their designated representatives.

All work by employees pertaining to confined spaces, welding safety, and lockout-tag out, will comply with all requirements of these safety practices.

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Confined spaces must be emptied of corrosive or hazardous substances before entry. All lines into a confined space containing inert, toxic, flammable, or corrosive materials must be valved off, blanked, or disconnected and separated. Impellers, agitators or other moving equipment inside confined spaces must be locked out.

For the purpose of this program, confined space is divided into two categories as follows:

1. **Non-permit confined spaces (Type C):**

This type of confined space usually does not contain and has minimal potential to contain any atmospheric or other hazards which can cause injury or illness, or which can be continuously ventilated to clear and keep any hazardous atmosphere from reforming in the confined space.

- a. Is large enough and so configured that an employee can enter and work.
- b. Has limited or restricted means for entry or exit such as manholes, tunnel systems, tanks, silos, storage bins, hoppers, vaults and pits, where there is no water, sewage or decaying material hazards and work is limited to inspection. If other work is to be performed, reclassification may be required.
- c. Is not designed for continuous employee occupancy.
- d. An approved operating procedure is required.

2. **Permit-Required Confined Spaces (Types A and B)**

The difference between the two type of permit-required confined space is a matter of the degree of the hazard. Type A permit-required confined spaces are those in which the atmosphere is considered immediately dangerous to life and health if not entered without proper protection. Type B permit-required confined spaces are those there is a potential for causing injury or illness, but are not considered immediately dangerous to life and health. For the purposes of this program, the procedures for both Type A and Type B confined spaces will be the same. A Type A or Type B confined space has all the characteristics of a non-permit required confined space and one or more of the following other characteristics:

- a. Contains or has a potential to contain a hazardous atmosphere.
- b. Contains material that has the potential for engulfing an entrant.
- c. Has an internal configuration which would cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section.

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- d. Contains any other recognized serious safety and health hazard.
- e. An approved operating procedure is required.

Any company employees who will enter any permit-required confined space(s), will do so by following the procedures outlined in this permit-required *confined* space program.

If the documented test data show that the only hazard posed by the space is an actual or potential hazardous atmosphere that can be controlled within the specified safety criteria stated above, through continuous forced air ventilation alone, requirements for permit space entry will not have to be enforced and the space may be entered under the procedures as outlined in Non-Permit Confined Space Entry Program. However, procedures will be required for any work to be performed and continuous ventilation and monitoring will then be required.

COORDINATION WITH OTHER CONTRACTORS

When employees of a subcontractor are to work in facilities containing confined space(s) that are controlled by an owner or a general contractor, the subcontractor's Superintendent shall coordinate all confined space entry requirement with a properly authorized representative of the owner or general contractor. At a minimum, the following information shall be exchanged:

1. The owner or general contractor shall appraise the subcontractor's Superintendent of all elements to include the hazards identified in the confined space; the experiences that the owner, general contractor or others have had with the space and, if appropriate, the reason(s) why a space is classified as a permit required confined space.
2. Any precautions or procedures that have been implemented by the owner or general contractor for the protection of their employees in or near the confined space area where employees of the subcontractor will be working should also be implemented for our employees as well.
3. All entry operations will be coordinated with all parties to protect the employees of the owner or the general contractor and employees of subcontractors or employees of any other contractor which are working near the confined space. If employees of any other employer are to work in the confined space simultaneously with employees of subcontractor, entry procedures shall be developed and implemented to ensure the safety of all authorized entrants, and to ensure that employees of one employer do not endanger the employees of another employer.

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4. Subcontractor's Superintendent shall obtain from the owner or general contractor all available information regarding the permit space hazards and any entry operations mandated by the owner or general contractor. The Superintendent shall provide a copy of this confined space program to the owner or general contractor for their review and approval before any entry operation is attempted by any Company employee. The owner or general contract shall indicate in writing its approval to use this confined entry program as is, or advise of any modifications by special requirements of the owner.
5. The Superintendent shall advise the owner or general contractor at the conclusion of the entry operation, regarding the permit space program followed, any hazards encountered or created in the permit spaces during entry operations, and any other actions taken to protect the safety of the assigned entry personnel.

PERSONAL PROTECTIVE EQUIPMENT

To protect personnel from becoming injured while entering, performing the required work and safely exiting the confined space, necessary personal protective equipment shall be maintained and provided by the Company to personnel involved in confined space work at no cost to the employee. There are certain basic protective equipment that should be worn at all times to include:

1. Head protection
2. Eye and face protection
3. Hand and foot protection
4. Appropriate clothing
5. Appropriate hearing protection
6. Approved respiratory protective equipment
7. Personal safety harness, lifeline and tripod
8. Approved lighting equipment, flashlights, etc.

In certain conditions, there may be a need for protective clothing, hearing protection, respiratory protection and body harness. Before an employee enters any confined space, the interior of the space shall be evaluated for the type hazards that may be present in the space and appropriate personal protective equipment shall be issued.

LIGHTING EQUIPMENT

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Appropriate lighting shall be provided within and outside the confined space to allow employees to enter safely, perform the required work and exit the confined space. Some of the precautions that shall be taken when selecting lighting are as follows:

1. If the atmosphere inside the confined space is classified as flammable or explosive, the electrical equipment used shall conform to Article 500, National Electric Code.
2. All personnel entering a confined space which has been tested and classified as flammable or explosive shall be provided with explosion-proof flashlights, if other means of lighting are not available.
3. Extension cords in damp or wet areas could cause electric shock hazards. Only approved low-voltage (6 or 12 volt) lights and extension cords with ground fault circuit interrupters should be used in confined spaces.

BARRIERS AND SHIELDS

Appropriate barriers and shields shall be used to isolate the confined space from personnel who are not directly involved in the entry operations. High visibility warning tape may be used to keep unauthorized personnel at a safe distance. If the confined space is located in an area accessible to public, barriers that keep pedestrian and vehicular traffic away from the entry operation shall be erected.

Before the entrance cover to the confined space is removed, the area around the entrance shall be inspected and all unsafe conditions eliminated.

Immediately after removal of the entrance cover, the opening shall be guarded by a railing, temporary cover or other type of barrier as appropriate that will prevent an accidental fall through the opening and to protect the employee(s) working in the space from objects that may fall into the space.

ENTRY AND EXIT EQUIPMENT

When possible, ventilation equipment (fans, blowers, ducts, etc.) will be installed and operated prior to confined space entry to provide a safe atmosphere for the worker. The ventilation equipment inlet will be placed so that vehicle exhaust or carbon monoxide cannot enter the confined space.

Ladders and other types of equipment that provide safe entry and exit to the authorized entrants from the confined space shall be available at the entry location. Necessary precautions shall be taken to ensure that this equipment does not interfere with the ventilating equipment.

RESCUE AND EMERGENCY EQUIPMENT

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Work rescue equipment, including lifelines, belts, stretchers, mobile cranes, hoists or other suitable equipment needed to rescue an individual from the confined space shall be available at all times. Since the conditions and space characteristics vary from one situation to another, the necessary equipment shall be selected based on the potential hazards and possible contingencies expected to occur during the entry operations.

A properly trained attendant shall be positioned outside the permit space to observe the status of the entrants. The attendant shall be equipped with a two-way radio or have immediate access to a telephone or other workers nearby so he or she can summon rescue and emergency services. The standby attendant is prohibited from entering the confined space without lifelines and approved respiratory equipment.

TESTING OF CONFINED SPACE ATMOSPHERE

Before any type of confined space (permit or non-permit) is entered into by employees, the space shall be tested with a calibrated, direct reading instrument to determine if acceptable entry conditions exist.

If a permit space is large or is part of a continuous system (i.e. a sewer), pre-entry testing shall be performed to the extent feasible, and if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entry personnel are working.

When testing for atmospheric hazards, it shall be done in the following order shown (i.e. oxygen concentration, combustible gases and vapors, and toxic gases and vapors).

1. Atmospheric oxygen concentration (not below 19.5% or in excess of 23.5%).
2. Flammable gas vapor or mist (not to exceed 10 percent of its lower flammable limit (LFL))
3. Airborne combustible dust that meets or exceeds its lower flammable limit (this concentration may be approximated when the dust obscures vision at a distance of 5 feet or less).
4. Atmospheric concentration of any substance for which a dose or permissible exposure limit is published and which could result in employee exposure in excess of the dose or permissible exposure limit. (Refer to Subpart C, Occupational Health and Environmental Control, and Subpart Z, Toxic and Hazardous substances in OSHA Safety and Health Standards (29 CFR 1910) and related state codes for exposure limits).

If oxygen consuming equipment is to be used in the confined space sufficient air is provided by the ventilation system to maintain an oxygen concentration of at least 19.5 percent by volume. Continuing testing will confirm the adequacy of oxygen levels.

ISOLATING ENERGY SOURCES

Before any confined space is entered by employees, the space shall be removed from service and shall be completely protected against the release of energy and/or material(s) into the space. This means that all energy sources leading to the confined space or located within the confined space which are potentially hazardous to the workers shall be locked out, tagged, relieved, disconnected, and/or restrained. Potentially hazardous energy sources include:

1. Electrical
2. Mechanical
3. Hydraulic
4. Thermal or radioactive Sources
5. Gravity

The objective for isolating all energy sources is to prevent unexpected or accidental energizing, stand-up or release of stored energy that could cause injury to workers within the confined space.

FIRE PROTECTION

To preclude the possibility of fires occurring in the confined space that could become a hazard to the workers inside, the following precautions shall be taken as a minimum:

1. Determine if work permits from the owner's fire department are required. If so, obtain same before the start of any operation.
2. Access and egress to and from the confined space shall be maintained clear of any obstructions at all times. If welding or cutting is to be performed in the confined space, combustible materials shall be covered with flame-retardant materials.
3. Flammable liquids (i.e. acetone, alcohol, etc.) shall be stored in UL or FM approved containers. The amount of flammable liquid(s) brought into the confined space shall not exceed the amount needed to perform the work each day. Maintain an inventory of all flammable materials brought into the confined space each day.
4. Properly rated fire extinguishers shall be immediately available.
5. Cylinders containing oxygen, acetylene or other fuel gases shall not be taken inside the

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confined space.

6. All rags, brushes, wipes, gloves, etc., shall be stored in metal containers with lids.
7. A person shall be posted during all welding, burning and heating operations to monitor for fires, and ensure that after the work has ceased or at the end of a work shift there are no fire conditions present.
8. All flammable gas equipment, hoses, torches, etc., shall be free of defects and inspected by the user prior to such operations.
9. To eliminate the possibility of fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut whenever the torch is left unattended for long periods of time, such as during lunch breaks. At the end of a work shift, the torch and hose shall be removed from the confined or enclosed space. Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas-consuming device.

EVACUATION OF A PERMIT SPACE

Should a situation occur where a hazardous condition develops, the authorized entrants shall immediately notify the attendant that the space is being abandoned. The attendant shall notify the rescue services and assist the authorized entrants in any way possible, but it is important that the attendant never try to enter the permit space.

1. If hazardous conditions are detected during entry, employees must immediately leave the space and the space must be evaluated to determine the cause of the hazardous condition.
2. The Foreman shall terminate entry and cancel the entry permit when:
 - a. The entry operations covered by the permit have been completed.
 - b. A condition arises which is not covered under the permit. The circumstances of the situation must be noted on the canceled permit and should be used in revising the permit space program.
3. The subcontractor shall retain the canceled permit in the permanent job file.

TRAINING AND EDUCATION

Each subcontractor will provide proper training to all its employees before their initial work assignment in a permit space

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1. Upon completion of this training, all individuals who participated in the training will be tested to ensure that they understand and have the necessary knowledge and skills for the safe performance of their duties. Additional training will be given when:
 - a. The job duties change.
 - b. There is a change in the permit space program or the permit space presents a new hazard.
 - c. When the job performance of any employee shows deficiency.

Training will also be given to rescue team members to include CPR and first aid training. Upon completion of training the a certificate of training will be issued to those employees who successfully completed the training. The certificate will include the employee's name, the signatures of the trainers, the date(s) of training and the certificate expiration date.

2. Instructors conducting the training shall be competent in permit-required confined space entry either through education or experience. They shall further have thorough knowledge of confined spaces, hazards associated with toxic atmospheres, monitoring equipment personal protective equipment and emergency rescue planning. Instructors shall also be knowledgeable in blinding and purging operations, lockout/tagout procedures, ventilation and toxicological effects.
3. Considering the fact that there are a large variety of confined spaces with their own unique requirements, Company employees shall receive additional instructions that cover the specifics of a particular permit space prior to entry into the space.

RESCUE AND EMERGENCY SERVICES

On some sites, the owner's fire department will conduct rescue operations.

Each subcontractor shall have at least one trained individual available at the jobsite where permit space entry is to take place to provide rescue services.

The individual designated to provide rescue services shall be provided with personal protective equipment and other rescue equipment necessary to make rescues from permit space. This individual shall be trained in the use of the personal protective equipment and shall hold a current certification in CIPR and first aid.

The Company rescue service person shall coordinate with the general contractor and the owner to identify the rescue equipment that needs to be available at the permit space and establish procedures that are to be followed in case rescue becomes necessary.

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In cases where the Company rescue service person is required to enter the permit space to perform rescue, he/she shall be equipped with a chest or full body harness with a retrieval line attached at the center of the back rear shoulder level or above the head. The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in a manner that will allow rescue to begin immediately. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than five (5) feet deep.

The Company rescue service person shall receive the same training as the entry personnel. The rescue service person shall also practice making a simulated rescue from a space similar to the permit space where personnel will have to work.

Where an entrant is exposed to a substance in the permit space that will require treatment at a medical facility, a copy of the MSDS for that substance will be provided to the treatment facility.

5.17 TOXIC AND HAZARDOUS SUBSTANCES

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HAZARDOUS CHEMICAL EXPOSURES

Employees are trained in the safe handling practices of hazardous chemicals such as acids, caustics, and the like.

Employees are aware of the potential hazards involving various chemicals stored or used in the workplace -- such as acids, bases, caustics, epoxies, and phenols.

The employee exposure to chemicals is kept within acceptable levels.

Eye wash fountains and safety showers are provided in areas where corrosive chemicals are handled.

Containers, such as vats and storage tanks labeled are labeled as to their contents -- e.g. "CAUSTICS".

Employees are required to use personal protective clothing and equipment when handling chemicals (i.e. gloves, eye protection, and respirators).

Flammable or toxic chemicals are kept in closed containers when not in use.

Chemical piping systems are clearly marked as to their content.

Adequate means are readily available for neutralizing or disposing of spills or overflows properly and safely where corrosive liquids are frequently handled in open containers or are drawn from storage vessels or pipelines.

The standard operating procedure for cleanup of chemical spills is to immediately contact the

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cleanup subcontractor that has specialized knowledge and equipment for cleanup.

Respirators and other personal protective equipment are stored in a convenient, clean, and sanitary location. Respirators intended for emergency use are adequate for the intended use.

Employees are prohibited from eating in areas where hazardous chemicals are present.

General dilution or local exhaust ventilation may be used to control dusts, vapors, gases, fumes, smoke, solvents, or mists generated during the work provided that threshold limit values and permissible exposure limits are not exceeded.

Generally, dusts are vacuumed for collection, rather than swept or blown by air during cleanup.

Materials that give off toxic, asphyxiant, suffocation, or anesthetic fumes are stored in remote or isolated locations when not in use.

HAZARDOUS SUBSTANCES COMMUNICATION

A list of hazardous substances used at the jobsite is maintained by the Superintendent or Project Manager.

A Material Safety Data Sheet is available at the jobsite for each hazardous substance used on the project.

Other employers are informed about the hazardous substances in regularly scheduled construction meetings held at the jobsite.